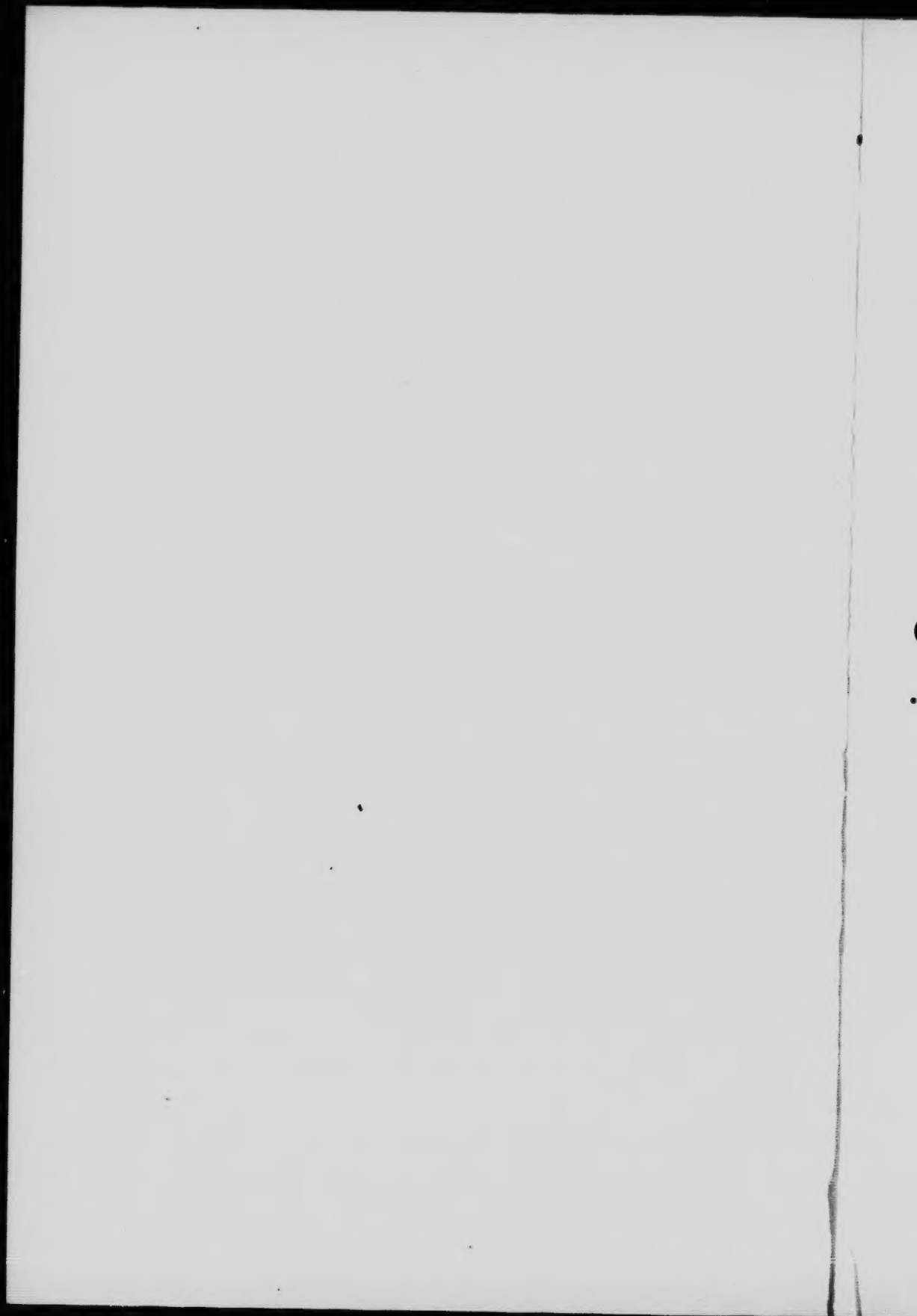


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Report of Proceedings

OF

First and Second Annual Conventions

OF THE

CANADIAN INSTITUTE OF SANITARY ENGINEERS

HELD IN

Winnipeg
1913

— and —

Edmonton
1914

BIBLIOTHECA
SANITARY ENGINEERS

Headquarters: 223 James Street, Winnipeg

WILLIAM McFARLANE, Secretary
223 James Street, Winnipeg



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Canadian Institute of Sanitary Engineers

SYNOPSIS OF FIRST CONVENTION

held in

**BOARD ROOM, INDUSTRIAL BUREAU
WINNIPEG**

April 16th, 17th, 18th and 19th

1913

Officers of Canadian Institute of Sanitary Engineers, 1913-14



Jas. Smith, Winnipeg
President



W. McFarlane, Winnipeg
Sec.-Treas.



E. P. Fletcher,
Calgary
1st Vice-Pres.



J. G. Morgan,
Vancouver
2nd Vice-Pres.



G. G. Taylor,
Saskatoon
3rd Vice-Pres.



A. J. Peckett,
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4th Vice-Pres.

Board of Directors and Executive Committee



Thos. Watson,
Regina



John Wooding,
Winnipeg



H. O. Nash,
Edmonton



A. J. Warr,
Prince Albert



J. R. Huntbach,
Edmonton



G. E. Knechtel,
Saskatoon



S. MacNamara,
Fort William

First Annual Convention

Canadian Institute of Sanitary Engineers

Winnipeg was honored as the first meeting place of the Canadian Institute of Sanitary Engineers, an event which has been looked forward to for many months by those interested and engaged in affairs pertaining to plumbing and sanitation in Western Canada.

The meeting was called with a view to forming a society or association and also to standardize material and methods of construction in plumbing, and to this end invitations were early sent out to the different municipalities, provincial governments, master plumbers' associations and journeymen's unions throughout Western Canada to send delegates.

Two days before the Convention opened the delegates commenced to arrive, the first contingent to reach the city being from far-off Edmonton closely followed the succeeding day by the delegates from Calgary, Vancouver, Fort William and Port Arthur. By the time the Convention was opened on the morning of the 16th practically every large City in Western Canada, from Fort William to Vancouver, was represented.

The morning of the first day was occupied by the registration of delegates, the appointing of a chairman and secretary (pro-tem) J. Smith and W. McFarlane, both of Winnipeg, being chosen for the respective positions. A resolution was then introduced setting forth the desirability of forming a society or association, which was unanimously adopted and a committee was appointed to consider and report on the constitution and by-laws. Chairman Jas. Smith, Chief Plumbing Inspector of Winnipeg then addressed the convention, and in an inspiring talk set forth the objects of the society. A recess was then voted to partake of luncheon given by the City of Winnipeg.

When full justice had been done to the excellent luncheon, His Worship Mayor Deacon in a short address, welcomed the delegates and commented very favorably on the objects of the meeting and the benefits to be derived from the standardization of plumbing laws. Alderman J. J. Wallace, Chairman of the Reception and Entertainment Committee of the City Council, also spoke, and Mr. Watson, Provincial Inspector for Saskatchewan, in reply thanked the City Council and the Citizens of Winnipeg for the generous and hearty welcome.

The real business of the Convention commenced with the 2 o'clock session, and there were few uninteresting moments during this or the succeeding business sessions of the Convention; indeed, so enthusiastic did the delegates become in the work that on Friday evening, when it was seen that the program could not be completed on time, it was decided by a unanimous vote that an additional session be held on Saturday.

The features of the Wednesday afternoon session were the endorsement of the necessity of a final air or smoke test on the completion of a job, and the discussion arising out of the reading of a paper by R. J. Thomas on "House Traps". The Convention went on record as unfavorable to the use of house traps.

The morning session of April 17th was devoted to the reading of a paper by G. G. Taylor, of Saskatoon, on "Drains, Soil Pipes and Main Waste Pipes", which resulted in the standardizing of cast iron, wrought iron or steel, brass and lead pipe, followed by a paper on "Pipe Terminals" by W. McFarlane, Winnipeg. The manner of protecting pipe terminals in Winnipeg was subjected to some harsh criticism, the opinion as a result of experience by other delegates in cities further West being that pipes should be increased 2 inches and finished flush with the roof, and the flashing caulked into a hub. This method was adopted.

In the afternoon, papers were read on "Fixture Traps," by J. McNeill, and on "Vent Pipes," by E. Samson, both of Winnipeg, and proved battle ground for much interesting discussion. The whole question of sizes of soil, waste and vent pipes and the relation they should have to each other was finally deferred to the next Convention, when a special committee will report. In discussing this point the recent paper by Mr. Claffy, of Chicago, was favorably commented on as opening up a new line of study.

On April 18th the morning session was entirely taken up in the election of officers and adoption of the constitution, which is very much similar to that of the American society, though somewhat wider in its scope, and allows representatives from master plumber's associations and journeymen's unions to become active members to a limited degree, and both will have a representative on the Board of Directors. This step was taken to widen the scope of the institution and encourage a freer discussion in all questions affecting the trade.

The election of officers was then taken up, with the following result: President, Jas. Smith, Winnipeg, Manitoba; First Vice President, E. P. Fletcher, Calgary, Alberta; Second Vice President, J. G. Morgan, Vancouver, British Columbia; Third Vice President, G. G. Taylor, Saskatoon, Saskatchewan; Fourth Vice President, A. J. Peckett, Port Arthur,

Ontario; Board of Directors—Thos. Watson, Regina, Harry Nash, Edmonton and J. Wooding, Winnipeg. Wm. McFarlane, Winnipeg, Secretary Treasurer.

Prior to the election of officers a letter from Thos. J. Claffy, president of the American Society of Plumbing Inspectors and Sanitary Engineers, Chicago, Ill., was read, and it was unanimously decided to spread it on the minutes and the thanks of the members to be tendered.

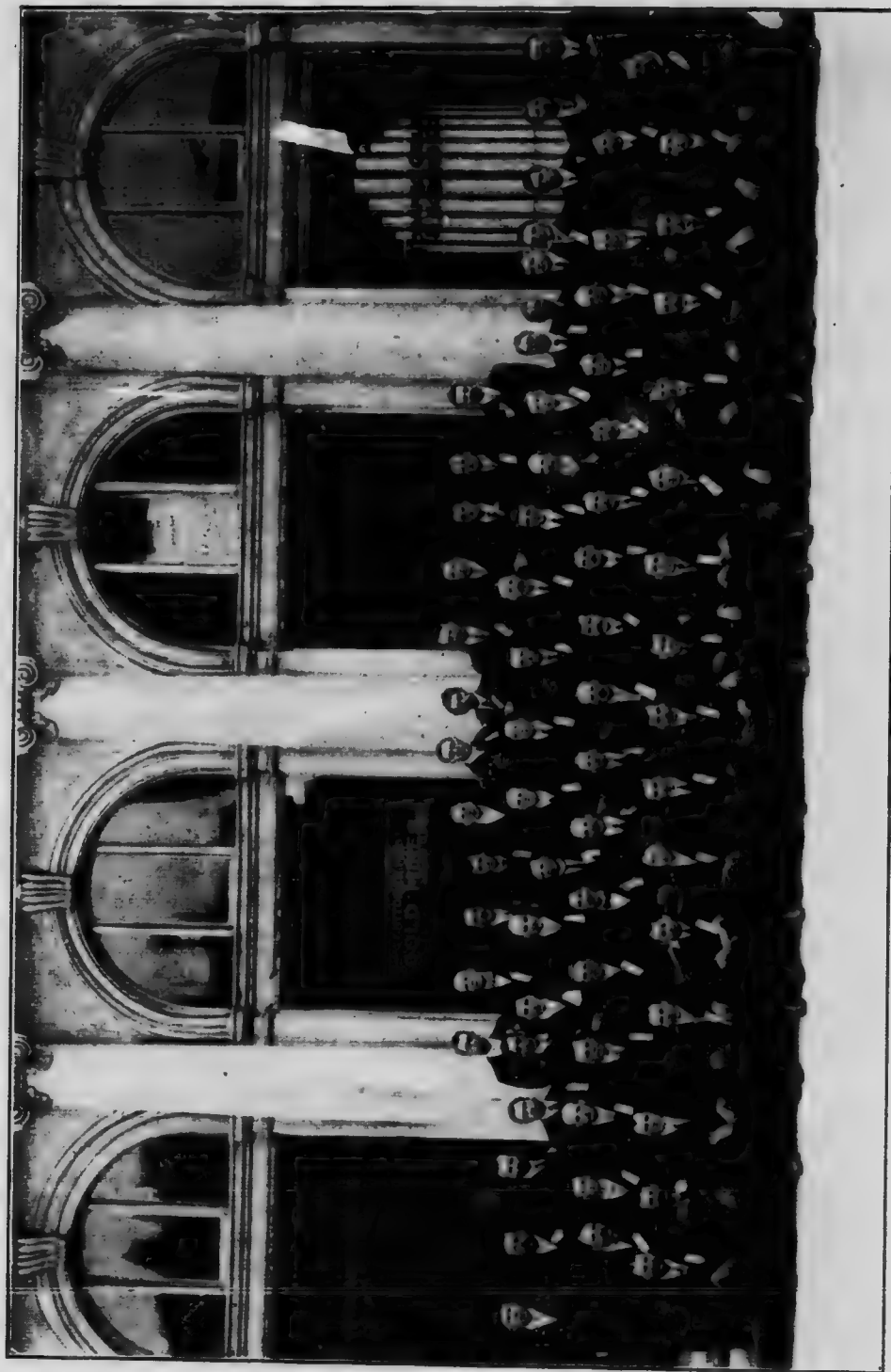
In the evening the delegates were entertained by the jobbers, manufacturers and commission agents at a banquet in the Royal Alexandra Hotel, which proved a huge success. H. Agnew presided.

On the day following the business was completed. It was unfortunate that time did not allow of the discussion of the excellent paper by E. P. Fletcher, Calgary, on "Examination of Plumbers" and so no pronouncement on the subject was made by the Institute. It is intended to feature this and other matters not thoroughly dealt with, such as vents, soil pipe fittings, etc., at the next convention.

If the meeting did not do anything more, it demonstrated both by exhibits and discussion the great variety and methods used throughout the different cities and the urgent necessity for standardization. The delegates also realized that too much had been attempted at this inaugural meeting, but such a mistake is valuable, inasmuch as it can be avoided at future meetings. All the delegates freely admitted the great value from an educational point of view the convention had been, taking in as this had, the whole range of plumbing installation.

The last business transaction was the selection of Edmonton for the next convention.

For a couple of hours in the afternoon the delegates toured Winnipeg in automobiles to get a view of the City before departing their several ways, and all were loud in their praise of the courtesies and entertainments provided for them.



GROUP OF DELEGATES ATTENDING 1st CONVENTION

Canadian Institute of Sanitary Engineers

REPORT OF SECOND CONVENTION

held in

Empire Auditorium, Edmonton

May 4th, 5th and 6th

1914



REPORT
.. of ..
Second Annual Convention
of the
Canadian Institute of Sanitary Engineers
Held in Empire Auditorium, Edmonton
May 4, 5 and 6, 1914

The convention was opened on Monday morning, at ten o'clock by the Secretary, William McFarlane, reading the minutes of the last meeting. Auditors were appointed to examine the financial statement. The President, Jas. Smith, Chief Plumbing Inspector of Winnipeg, then delivered his address which received hearty applauding.

President's Address

Gentlemen:—

"At our meeting in Winnipeg a year ago when this Institute came into existence, when we pledged ourselves to band together and work for the uplift of the plumbing trade in general and the standardization of both material and construction in Plumbing work, all tending towards the preservation of public health which after all is the important factor in the work of all Sanitarians. Since that time we have learned much and it is only now at the end of a winters hard research work that we realize how vast is the task we have set ourselves. But if the spirit in which these pledges were made and the zeal with which the work has since been carried forward is any indication of the ultimate result then we have nothing to fear. Our task will not be finished in a year and it may take several years ere the fruits of our labors are even apparent, but I have no doubt whatever that if we remain banded together we can accomplish all that to which we attain.

Some criticism has been levelled at the name of our Institute but I think most of you will agree with me that it is a good name even if it does not err on the side of modesty. Other critics have objected to the broad grounds we have taken in the admittance of members, but, gentlemen, that in my opinion is the wisest step we took in the formation of our Institute. Why should not every section of men connected with the trade have a voice in the making of legislation governing the work they are doing, co-operation is the striking characteristic of this age we live in, and we must realize that just as one man cannot accomplish

much alone so no one section of our craft can do effective work if they are to be at all times at variance with the other organizations in the trade. In inviting both Master and Journeymen Plumbers to a participation in our meetings we hope not only to get a broader view of the whole subject of Sanitary Plumbing but we also expect a more loyal adherence to the measures adopted at such a joint conference. It would in my opinion be an ideal condition of affairs if all branches of the trade could be equally represented at these annual meetings. It will be a most important business of this convention to determine to what extent our active membership should extend to avoid the possibility of any particular coterie getting undue control of the organization.

In this enlightened age the desirability and necessity of Sanitary Plumbing is beyond question and in recent years scientific research has demonstrated the fallacies of early Sanitarians and placed on a new basis the relationship between sanitary plumbing and public health. We have seen that old argument that sewer air was directly responsible for most of the infectious disease man is heir to swept into the region of mythdom and at the same time learn that sewer air is comparatively pure and in most cases containing less bacteria than street air. Although Bacteriologists have disabused our minds of this fallacy there is still another phase of the question to be considered which is probably quite as important and that is the predisposing action of sewer air. It has been clearly demonstrated that the health of persons subjected to an atmosphere of sewer air in a more or less concentrated form will deteriorate and in extreme cases death has been the result, a condition due not to the presence of bacteria but to the absence of oxygen in sewer air and the presence of other injurious gases. It will thus be seen that whereas the earlier theories were wrong, it is still true that on ordinary insurance principles it is wise to prevent as far as possible the entrance of sewer air into buildings, and Municipalities are justified in taking means to this end.

This, gentlemen, should be your attitude to the proposed legislation we are about to consider at this meeting.

The future development and value of this organization will depend entirely upon the devotion of its members to truth and the common good, and the zeal with which your knowledge is applied to the raising of the standards of Sanitary Plumbing throughout this Western Country, than which there is none better, I am firmly convinced that you are not only ready but willing to render this service."

Following up his set speech the President went on to speak of the aims of the Institute, and the difficulties they would meet. They had invited Master and Journeymen Plumbers to join with the Inspectors, believing they could do better work together than individually. He suggested that the meeting would be open to all, but that when voting on legislative matters and By-Laws, there should be one vote for Inspectors, one for Journeyman and one for the Masters from each City or Municipality so that one class could not influence the voting unduly, and there shall be no voting by proxy.

G. Knechtel, Saskatoon: It would take a number of conventions, to make a Uniform By-Law, and a good deal of work would have to be done outside of conventions.

The delegates did not talk of dollars and cents, but rather of plumbing as a business, the standardization of fittings and so on.

H. Nash, Edmonton, thought the President's suggestion of one vote for each class the best, that the Institute be composed of all branches so that they could all work together; otherwise they would not be able to frame a good By-Law.

Geo. Wharton, Winnipeg, suggested the more votes the better.

Replying, the President said, that if they admitted any body indiscriminately, it would be a race between the three organizations to see which would get the most active members at the convention to swing the voting one way. It was the intention to form chapters of the Institute in each City, which could meet during the winter months and discuss these matters and bring their recommendations to the convention each year. They could not in fairness to the small Cities give every member a vote.

G. G. Taylor, Saskatoon, remarked that the constitution of the American Institute had been adopted, and asked was there any mention in that of voting powers.

On investigation it was found that there was no mention made. Whereupon Mr. Taylor moved, that this suggestion be adopted. Mr. Smith said this could be left to a resolution committee to be appointed shortly.

At this point E. P. Fletcher, Calgary, made a suggestion that it would be advisable to have a provincial vote. The prairie provinces were fully represented while British Columbia was represented by only one City. Thus giving an overwhelming vote against the latter province. Having a Provincial vote would equalize matters.

G. E. Knechtel, Saskatoon, said he favoured a system by which each Province would send a delegate; or he would suggest that each incorporated City have vote instead of the Province.

E. P. Fletcher, Calgary, suggested that the Provincial Health Officer act for his Province and have an active part in the discussions.

President: Do you mean that you want them to become active members with voting power?

E. P. Fletcher: Yes, you can't expect a man to be interested unless he has a voting power.

Neil Beaton, Saskatoon, thought the Cities might not be so well acquainted with the Provincial Health Officers. Why not have a Provincial Association affiliated with this Association, and invest them with the power to vote. Then they would be nearer a solution.

Horace C. Nixon, Saskatoon: Mr. Fletcher's suggestion is a good one. Get the Provincial Health Officer here and educate him if he is wrong. If we are wrong, let him educate us.

G. E. Knechtel, Saskatoon, observed that the only objection to the Provincial Officers was that their work was broad. Sanitary Engineers were specialists—some thought they were too much specialists—it was alright to educate them, but why not spend the time educating themselves.

Harry Nash, Edmonton: I'd like to see them here, so that our laws would comply with the Provincial By-Laws, and they could assist us in that.

Duncan Campbell, Medicine Hat, told of the power vested in Medical Officers of Health, and suggested that they be invited to help in getting the present laws repealed, and new ones made for the whole Province.

J. T. J. Vallance, Lethbridge, also favoured this suggestion, whereupon a Committee composed of Messrs. Fletcher, Nixon and Nash were appointed to discuss changes in the Constitution and By-Laws.

The auditors reported that they had gone over the financial statement with the relative vouchers and found everything satisfactory, showing an income of \$155.00. Expenditure \$102.38, leaving a balance on hand of \$52.62.

They also beg to recommend that Mr. McFarlane's expenses be paid.

The President agreed with them in this, and took the opportunity to tell of the hard work performed by Mr. McFarlane in working out the Convention details, adding that it was due to his splendid work that such a convention was possible.

H. A. Mathias, Regina, joined in the opinion that Mr. McFarlane's services should be acknowledged, and suggested that he be given the \$50.00 balance in the bank. The matter was eventually left over on the suggestion of Mr. Nash, who thought the amount could be increased.

The Secretary reported he had received the following greetings:—

From the American Society of Inspectors of Plumbing & Sanitary Engineers.

Mr. Jas. Smith,

Dear Sir:—

In the name of the above Society I wish to extend greetings to the Canadian Institute of Sanitary Engineers in Convention assembled and wish you success in your endeavours.

(Sgn.) Jos. J. Claffy,
President.

From the Sanitary Inspectors Association of Western Canada.
Mr. Jas. Smith.

Dear Sir:—

On behalf of the above association I extend to you heartiest greetings and best wishes for a successful convention.

(Sgd.) A. Officer,
Secretary Treasurer.

Telegram from Metals Ltd., Lethbridge, expressing the hope that the members would arrange for a Uniform By-Law to be adopted by the Province.

J. G. Morgan, Vancouver, expressed his regret at not being able to be present and hoped that the members would have as good a time as was compatible with the performance of their duty.

An invitation was received from the Secretary of the Retail Merchants Association, Alberta Branch, to attend the convention of the above at Calgary, on May 7th, to meet the Sanitary & Heating Engineers' section of the Association. An invitation to a banquet was also included.

The meeting adjourned to partake of luncheon as guests of the City Council of Edmonton.

Mayor McNamara, being unable to be present, his place was taken by Ald. Joe Clark, with J. R. Huntbach, Edmonton, as chairman. After the delegates had eaten a hearty luncheon Mr. Huntbach called on Ald. Clark to address the gathering.

The latter delivered a rousing speech in which he showed a thorough grasp of the subjects being discussed by the Institute. After extending a hearty welcome to the delegates, he drew attention to the fact that a ball game would take place in the afternoon between Edmonton and Saskatoon, and it was his duty as chairman of the ball committee to see that no Saskatoon member attending the Convention got in, and spiked the Edmonton players. He advised them to get through their business as quickly as they could, or they would have difficulty in seeing the game. Proceeding, he stated that he was a lawyer, and they resembled one another in their reputation for making large bills that would make a Rockefeller quake in his shoes. He hoped they would make their accounts large enough to keep the wolf away from the door, but not too large, or they would not get them paid, when they would go to the lawyers, and then wish they had'nt.

He referred to the important work required from Sanitary Engineers in the West—more important than that in the settled districts of the East. The only way to grapple with the difficulties that present themselves was with Conventions like this. It would be much better if they had Uniform laws governing plumbing in Western Cities. Different laws worked to the disadvantage of all concerned.

They were there making history, and people in future years would marvel, and wonder how they accomplished it. They would find the City Council of Edmonton the most willing of any in the West in making the new By-Law effective. (Cheers).

He was followed by the President, who informed them that he did not intend to say much, as Mr. Anthes had asked him to be brief so that he could get a word in.

Mr. Anthes, Winnipeg, on rising, refuted this, and hoped he could not judge Western veracity by Mr. Smith. Mentioning the subjects being discussed by the Convention, he said the standardization of fittings would mean a big difference in the number of sizes they would be required to manufacture.

This ended the speeches.

Mr. Smith asked members to get to work quickly so that they would be in a position to see the ball game.

Monday, May 4th, 2 p.m.

Chairman: Gentlemen, I will ask the resolution committee to report on the matters referred to them in the morning session.

H. C. Nixon, Saskatoon: I would like to ask that all members have copies of the Constitution handy so that they can refer to it. If they will find page 5 then I will start in. The committee recommend that a new section be added to article 2, to be numbered section 3 and to read as follows:—The heading would be "Voting power on legislation." The votes on legislation will be vested in representatives attending as follows:—For each City one Master, one Journeyman, and one Plumbing Inspector. We also recommend that page 6, section 3 of article 3, be amended as follows:—On line 2 you will see, "shall become eligible to active membership." We recommend that the word "may" take the place of "shall," and at end of section these words be added "and are so passed by Board of Directors."

Chairman: Any discussion on this matter?

Mr. Swain, St. Boniface: I move that the report be adopted.

Chairman: Motion carried.

We are now going on to the next subject on the agenda, which is the consideration of "sizes of soil, waste and vent pipes." I will ask the Secretary to read the several recommendations from the different Cities.

Secretary reads recommendations.

SIZES OF SOIL, WASTE AND VENTILATING PIPES.

Winnipeg Recommendation.

Section 30.

Main Soil Pipes.

- 1 to 6 floors. For not more than 25 water closets and not exceeding 15 water closets above 4th floor—4 inches. If more than 15 water closets to be installed above 4th floor soil pipe to be—5 inches.
- 7 to 10 floors. For not more than 60 water closets and not exceeding 30 water closets above 8th floor—5 inches. If more than 30 water closets to be installed above 8th floor soil pipe to be—6 inches.
- 10 or more floors—6 inches.

In any case where it is found necessary to erect a main soil pipe for not more than 6 water closets located above 6th floor said main soil stack may not be less than 4 inches in diameter provided that this will apply only where no other fixture connect therewith below 6th floor.

Main waste pipe for kitchen sinks 1 to 4 floors and for 2 to 8 sinks	2	inches
Main waste pipe for kitchen sinks 5 or 6 floors and for 10 to 12 sinks	2½	"
Main waste pipe for kitchen sinks 7 or more floors and for 14 or more sinks	3	"
Branch waste pipes for kitchen sinks	1½	"
Main waste pipes for baths, wash basins and laundry tubs for three or more fixtures	2	"
Branch waste pipes for baths and laundry tubs	1½	"

Branch waste pipes for wash basins where not more than one installed	1½	"
Main waste pipes for ordinary slop sinks with 2" outlets 1 to 3 fixtures	2	"
Main waste pipes for ordinary slop sinks with 2" outlets 4 to 6 fixtures	2½	"
Main waste pipes for ordinary slop sinks with 2" outlets for more than 6 fixtures	3	"
Main waste pipes for pedestal slop sinks	3	"
Branch waste pipes for pedestal slop sinks	3	"
Main waste pipes for stall urinals	3	"
Main waste pipes for stall urinals, not more than 6 fixtures	2½	"
Branch waste pipes for stall urinals, 1 to 3 stalls	2	"

All branch waste pipes for kitchen sinks over 10 feet in length shall be 2 inches in diameter throughout their entire length and all horizontal waste pipes shall have a fall of at least a ¼ of an inch to the foot.

Four traps of 1½" or 1¼" in diameter and 3 traps of 2" diameter shall be considered equal to one trap of 4" diameter.

Section 44.

All traps shall be protected from syphonage and back pressure by anti-syphon or vent pipes, except where otherwise specifically provided by this By-Law. Such pipes shall be constructed according to the following table.

Diameter of Pipe	Maximum length of pipe which may be installed.	Number and Size of traps that may be vented thereby
1¼ inches	30 feet	1 trap, 1¼ in. in diameter
1½ "	30 "	1 to 3 traps of 1¼ in. to 2 in. diameter
2 "	50 "	1 to 3 traps of 3 in. to 4 in. diameter
2½ "	75 "	4 to 7 traps of 3 in. to 4 in. diameter
3 "	100 "	8 to 15 traps of 3 in. to 4 in. diameter
4 "	200 "	16 or more traps of 3 in. to 4 in. diameter

Four traps of 1¼" or 1½" in diameter and 3 traps of 2" in diameter shall be considered equal to 1 trap of 4" diameter.

Where loop or circuit vents are used not more than three traps shall be inserted on the loop or circuit without an intercepting vent pipe, and the vent pipe at the end of the line shall be taken off between the last two fixture fittings.

Section 45.

All offsets on ventilating pipes shall where practicable be made at an angle of not less than 45 degrees to the horizontal and in no case shall 90 degree elbows be used. Provided that all main ventilating pipes shall be full diameter throughout their entire length and shall connect at the bottom with soil or waste pipe or the house drain in such a manner as to prevent the accumulation of rust scale. In no case shall a main vent pipe be greater in diameter than the main waste pipe with which it connects. Branch ventilating pipes shall be carried at least 6 inches above the top of all fixtures connecting therewith and shall in all cases be kept not less than 4 inches and not more than 18 inches from the crown of connecting traps and not more than 3 inches below the

waste level of any trap, except water closets in which case no such vent pipe shall connect to the heel of a water closet bend, but shall connect above the centre line of horizontal part of bend. Where fixtures are installed above each other and where the discharge of the fixtures above exceeds twice the area of the main soil or waste pipe the nearest fixture to the stack on the lower floors shall have a continuous waste and vent pipe of not less than one-half the diameter of the main soil or waste pipe and the vent must rise at an angle of 45 degrees to the vertical.

Section 46.

Vent pipes shall not be necessary:—

- (A) Where the trap for the upper fixture on a stack is not more than 3 feet from such stack and the connection of the waste pipe to such stack is not more than 3 inches below the water level of the trap.
- (B) Where only one water closet is connected with a stack and is located not more than 3 feet from such stack.
- (C) Where two water closets are located not more than 3 feet distant from the stack on the same floor and discharge into a double Y branch, and no other water closet discharges into the stack above such double branch.
- (D) Where more than one water closet and one to three smaller fixtures are installed on only one floor. Provided that this will apply only in cases where the waste pipes from the smaller fixtures do not exceed 1½" in diameter and are connected directly and separately to the main soil pipe, at a point above the water closet connection in a manner as set forth in the foregoing sub-section A of this section.

Sections 47 and 48.

Vent or anti-syphon pipes shall where possible be run on the continuous waste and vent principle and shall be extended through the roof or may reconnect to a main soil or vent pipe at a point at least 6 inches above the highest fixture connected therewith.

Saskatoon Recommendation.

A separate vent pipe shall not be necessary:—

Where the inlet of the bath trap is located not more than 20 inches from any wash basin waste, said waste shall act as bath trap vent provided that the water line of the bath trap is not more than 1½" above the bottom of waste pipe at point of junction, and that the said junction is made at an angle of 45 degrees in the direction of flow.

Where closets are set in batteries, a 2 inch vent shall be taken off the drain pipe after every second closet, counting from the soil stack or outgo end.

Where there is more than one closet on a floor above, the nearest closet to the soil stack shall be vented in addition, as near to the trap of the fixture as possible. In no case shall branches for closets measure more than 24 inches total length from centre of drain to floor level without a vent.

The fall to drain of batteries of closets shall not be more nor less than ¼ of an inch to the foot run where laid on concrete floors.

There shall be a back vent or relief vent stack carried up from the drain into the main vent stack of batteries of closets.

SIZES OF DRAIN, SOIL AND WASTE PIPES.

That 3 inch cast iron drain and soil pipes may be used where not more than two closets and four other waste pipes of $1\frac{1}{2}$ inch diameter or their equivalent are installed thereon. The vent stack must be increased to 4 inches below the point where the branch vent enters it. All traps must be vented to prevent syphonage and back pressure.

The outlets from closet traps measure only 3 inches and the pipes will be scoured clean by the closet discharges.

That the sizes of house drains and soil pipes shall be determined by the number of soil and waste pipes discharging therein according to the following table:

Drain or Soil Pipe	No. of $1\frac{1}{2}$ inch wastes or their equivalent
3 inches internal diameter	12
4 " " " "	72
5 " " " "	120
6 " " " "	200
7 " " " "	260
8 " " " "	350

One closet or slop sink shall be considered equal to four $1\frac{1}{2}$ " waste pipes.

That the sizes and lengths of vent pipes shall be determined by the number and sizes of traps installed according to the following table:—

Internal diameter of vent pipe	Maximum length in feet	No. and sizes of traps that may be vented thereby
$1\frac{1}{4}$ inch	20 feet	1 trap of $1\frac{1}{4}$ inch deameter
$1\frac{1}{2}$ "	25 "	1 to 4 traps of $1\frac{1}{4}$ inch diameter
$1\frac{3}{4}$ "	10 "	1 trap of 2 inch diameter
2 "	50 "	1 to 3 traps of 3 inch to 4 inch diameter
3 "	100 "	3 to 12 traps of 3 inch to 4 inch diameter
4 "	200 "	13 to 24 traps of 3 inch to 4 inch diameter
5 "	300 "	25 to 40 traps of 3 inch to 4 inch diameter
6 "	400 "	41 to 70 traps of 3 inch to 4 inch diameter

Four traps of $1\frac{1}{2}$ " diameter shall be considered equal to one of 3" to 4" for computing sizes of vents.

That where branch drains enter main drain "Y's" and eighth bends shall be used, but where 3" or 4" horizontal soil branches enter vertical stack of larger diameter "T. Y's" shall be used.

That slop sinks shall be treated and fixed as if they were W. C's.

EDMONTON RECOMMENDATION.

Clause 30.

All soil and waste pipe shall be of not less than the respective diameters set out below:—

Main vertical soil pipe for not more than 30 fixtures in buildings of not more than 6 stories	4" pipe.
Main vertical soil pipe for not more than 60 fixtures in buildings not over 10 stories	5" "
Main vertical soil pipe for not more than 100 fixtures	6" "

Provided however that not more than 10 fixtures are required to connect with one main soil pipe on three or more floors above the fourth floor, otherwise special ventilation of the system shall be provided by intersecting vents which shall first have the approval of the Plumbing Inspector.

For the purpose of the above clause any fixture with an outlet of 3 inches or over and waste pipe shall constitute a fixture, otherwise:—

Two slop sinks shall be equal to one fixture.

Two urinals shall be equal to one fixture.

Two sinks shall be equal to one fixture.

Two baths shall be equal to one fixture.

Two laundry tubs shall be equal to one fixture.

Four basins shall be equal to one fixture.

Main vertical waste pipes for 12 sinks, L. tubs or baths 2 inches

Main vertical waste pipes over the above number 3 inches

Main vertical waste pipes for 4 basins 1½ inches

Main vertical waste pipes above 4 and not more than 24 2 inches

Provided that a clean out is installed on each sink or basin stack at intervals of not more than every second floor and same shall be easily accessible without the use of tools, for raising floor boards, etc.

Horizontal Branch Waste Pipes.

For W. C's. 4 inch, not more than 16 on one branch.

For slop hoppers or fixtures with 3" outlet and waste not more than 16 on one branch.

For Urinals, slop sinks, 2" Maximum Number, 6.

For baths, sinks, laundry tubs, foot or sitz baths, 1½" Maximum No. 2.

For basins, 1¼", Maximum number, 2.

Mr. Nixon, Saskatoon: I would suggest that the stenographer makes copies of these recommendations, so that each of us will have a copy before us.

Chairman: I was going to suggest that we appoint a committee to go over these recommendations to bring in a final recommendation.

Mr. Fletcher, Calgary: Personally I would prefer that they be discussed in open meeting. A committee was appointed last year and they did not have much time to spend on the matter. I would move that copies be made and that it be discussed in open meeting.

Mr. Huntbach, Edmonton: I would like to second Mr. Fletcher's motion. I think it is impossible to discuss this intelligently unless we have the data in front of us. It is asking us to cover too much ground and unless we have the data before us it is impossible to give an intelligent reply.

Chairman: It has been moved by Mr. Fletcher and seconded by Mr. Huntbach that we employ the stenographer to run off extra copies of these recommendations. It is a great deal of work, but I am informed by the stenographer that we can have them by tomorrow morning.

Motion carried.

Perhaps with your permission we might go on to the "standardization of pipes and fittings", and discuss it. There is a lot of information on blue prints and charts that we have put up on the walls and there is a lot of general information that will be required here. With that in view we had half a dozen drawings made and sent to the "Sanitary Engineer" of Toronto for publication in April 15th edition of their paper. We ordered 25 copies to be sent up here to the Convention but they have not been received yet. We will now consider "Pipe terminals."

Secretary reads recommendations.

PIPE TERMINALS.

Winnipeg Recommendation.

All terminals of soil, waste and ventilating pipes of 4" in diameter or less shall be increased 2" in diameter before passing through the roof of the premises, and all terminals of such pipes shall project to the outer air not less than 1 inch and not more than 2 inches above on the high side where passing through a pitched roof, and not less than 3 inches or more than 5 inches above where passing through a flat roof, provided that the portion of all such pipe terminals above roof shall have a hub of a size in proportion to which the pipe is increased, and the same shall be made weather proof by means of a lead flashing. All such lead used for this purpose shall be in weight at least 6 pounds per square foot and shall be worked over and into the hub with not less than 5 inches of cover on the roof on either side of the pipe terminal, and it shall be finished with a cast or wrought iron ring properly caulked into the hub which shall in no case project above such terminal.

All terminals of soil, waste and ventilating pipes shall where passing through a pitched roof be carried to a point within 2 feet of the ridge or peak of the roof, and shall be located not less than 10 feet from or 2 feet above any window, door or other opening in the same or adjoining premises provided that in all cases a roof with a pitch of 6 inches or more in 12 inches be considered as a pitched roof.

Saskatoon Recommendations.

That all vent pipes terminate not more than 1 inch above the pitch of roof on the high side and have a lead flashing turned down 1 inch all around inside the top of pipe dressed in tight and secured with a malleable iron ring.

All vent pipes to be carried up to roof and to terminate the same size unless the vent line is less than 4 inches in diameter, when it shall be increased to 4 inches, at least 3 feet below roof.

We claim that by the elimination of the roof jack and increaser and the consequent decreased surface, we lessen the radiation and therefore the deposition of moisture which congeals thereon.

All branch vents shall be carried back into the main stack before passing through roofs. This will reduce the number of roof terminals.

Edmonton Recommendation.

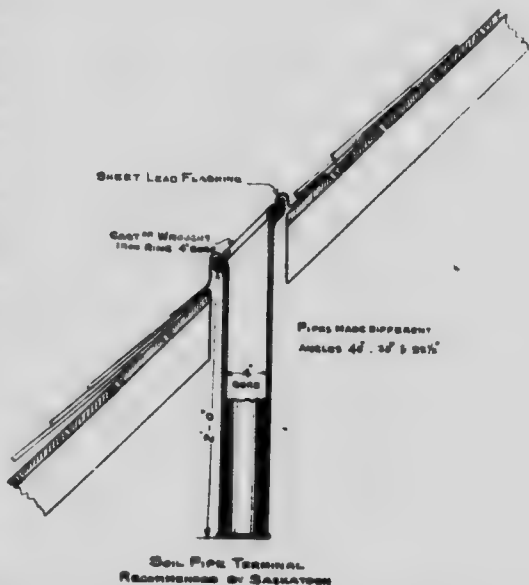
All soil, waste and ventilating pipes shall be located inside the premises; and all roof terminals of such pipes shall be located not less than 10 feet distant from any opening door, window, etc., in the same or any adjoining premises, nor shall a perpendicular from any roof terminal to the grade be nearer than 10 feet to the side line of lot; the roof terminal shall project 1 inch and no more above the highest point on the roof where such roof terminal intersects the roof.

All vent pipes of 4 inch diameter or less shall be increased at least 2 inches before passing through roof and no roof terminal shall be less than 4 inches where same passes through roof and shall terminate with a hub and shall be flashed with sheet lead turned down and caulked into the hub.

Chairman: What is your pleasure, gentlemen? Do you think you can discuss this matter intelligently without having the several recommendations before you.

Mr. Nixon, Saskatoon: This is a portion of our work upon which the various Cities have got pretty well into line. It is merely a matter of how the thing is to be worked out. Saskatoon has a drawing here of an idea of one of the Saskatoon Committee whereby the extra weight of material in the hub is done away with. With it done away with there is merely a rabbet at the top. It has the ring as advocated by the Winnipeg committee. We find, and the other committees have found the same, that where you increase the pipe below the roof, you retard the velocity of outcoming air and there you get moisture deposited and if you take away the radiation above the roof it does not lose its heat. The less metal we have there the warmer it will be and the less liable to freeze. If you will pass this drawing around you will see that these terminals are cut off at the top on the angle of the slope of roof or very near it. We show three different shapes and one of the three will accommodate any pitch of roof. That means that you will have the same projection on the high side of the roof and on the lower side of the roof.

Mr. Fletcher, Calgary: I agree with Mr. Nixon's remarks. If he increases that pipe at a considerable distance below the roof, I believe the velocity has decreased, but if he makes that increaser short, the shorter the better within reason, the velocity will not be retarded and the warm air will escape before touching the side of the pipe whatever. His terminal is of the same diameter throughout and the warm air is already expanded. It will start freezing on the edge of that increaser and will gradually collect until it forms a cover over the terminal, but if that increaser is short, the moisture gets away before it comes into contact with wall of the increaser. I believe it is generally agreed that the great mass of metal forming the roof jacks that we use, together with the increaser, are the great objections. It strikes me the shorter this terminal is the better.



Mr. Knechtel, Saskatoon: If you have a pipe coming up close to the roof, you will invite a stoppage by this current of cold air. In this country where we have such great density of cold air, you will have that trouble. The larger you make that increaser, and the deeper you make it, the heavier the body of air you will have to meet with; but why increase it at the roof at all? If that is the ideal condition, why not make your terminal 4 inch and not increase again at the roof. The proof for that is found in the finding of the three Cities. We all agree that the short abrupt terminals are better than the heavier jacks that we have been putting on.

Mr. Fletcher, Calgary: In reference to Mr. Knechtel's remarks, I think the use of the increaser at the low level would cause the air to expand and come into contact with the pipe. He also stated that there was a greater amount of cold air at the top and the cold air won't form frost. The use of a short increaser prevents the warm moist air from coming into contact with the metal, whereas if your warm air is already against the walls of the pipe, you have a chance for freezing.

Mr. Wharton, Winnipeg: If it is a necessity to increase the 4 inch pipe so that it will not freeze over, there may be just as much necessity to have the small pipes increased to 6 inches. We imagine that some of these small pipes will freeze over just as quick as the 4 inch pipes.

Mr. Mathias: There are some things concerning this matter that are coming in, in the way of reports, but I will not touch upon them, that when the report comes in they will not appear stale. It is my opinion that a 6 inch increaser is justified, and I think, with regard to the last speaker and what he said, the growth of hoar frost depends to a great degree upon the quantity of air that comes through it. When it meets the low temperature it deposits more particles around the rim than would be deposited by a 2 inch pipe. We know that a 4 inch pipe has just four times the area and therefore the capacity for delivery than a 2 inch pipe has. Therefore if you increase a 2 inch pipe to a 4 inch pipe and a 4 inch pipe to a 6 inch pipe you are increasing the volume and therefore the quantity of particles. I am quite in accord in cutting the terminal down to as low a point as possible. Any length that is exposed above the roof is a retarder. The way in which this frost comes is, that the moisture which is at first in the form of vapor, becomes formed into liquid or water at the point at which it comes into contact with the lead or the hub of the pipe, which must be below 32 degrees. I have had this confirmed, that it grows from that point and it is very seldom that there is any frost within the bowl of the pipe.

Chairman: We carried out a number of experiments with roof terminals, both protected and unprotected, just to determine what frost was deposited on them. These charts are on the wall. Chart No. 2 shows an 8 inch pipe unprotected which projects 18 inches above a flat roof. From this line you will see the frost formed day by day, from the 24th of January to the 24th of February, the coldest month we had last winter when the temperature did not rise above zero. You will notice on this chart it starts 8 inches and it went down to 5 inches as the temperature continued to drop to about 15 below zero. As soon as it went farther down it gradually closed up and when the temperature was about 20 below zero the pipe was entirely closed. So long as the temperature remained at 30 degrees below zero the pipe remained closed. As soon as the temperature rose it commenced to open again until the 17th of Feb. when the temperature was about 10 degrees below zero the pipe had opened to a little more than 5 inches. It is a very interesting chart: it shows you that even an 8 inch pipe will close up in direct ratio

with the rise and fall of temperature. Chart No. 3 shows a 6 inch pipe on the same building and under exactly the same conditions. It is an old building. On the 23rd Feb. there was only a 3 inch opening in that pipe. It only took three days to close it up entirely. It remained closed for the rest of the experiment. Chart No. 1 shows the result of an experiment with one of the roof caps which we have recommended, that is a 4 inch pipe increased to 6 inches. On the 23rd of January, the day on which this experiment commenced, there was a 5 inch opening on this 6 inch pipe and the opening never did decrease to less than 5 inches, it increased to 6 inches with the rise of the temperature. The increaser demonstrated that cutting down the pipe as close to the roof as possible will prevent freezing to a great extent. Photos No. 1 and 2 taken from an elevation looking down the pipe on the 3rd of February show very little ice on the pipe. Photos No. 3 and No. 4 taken on the 10th of February show quite an amount of frozen moisture on the pipe, but the opening had not decreased. Photo No. 5 taken on the last day of the experiment, the 25th of February there was roughly about a 17 or 18 inch ice wall formed on that pipe, built up on the edge of a 6 inch pipe, but still the opening had not decreased less than 5 inches. This picture is rather mis-leading; it shows a large amount of ice, but the opening had not decreased more than 5 inches. It was a 4 inch stack increased to 6 inches.

Charts and illustrations on next and following pages

Mr. Beaton, Saskatoon: Just along these lines we have got to use a great deal of discretion not only supplying pipe terminals that are safe but we have got to look to the cost of these terminals. We should not take the fact that they were not closed up as solely our aim. We should take into consideration the cost of installing these pipes. It is my humble opinion that cheaper installation is better for everybody concerned. It is better for the man that is paying for the installation and better for the manufacturer and certainly it is better for the Plumber. If we adopt one of the fittings that are on these drawings it means another special fitting. I have to admit however that these experiments carried on by the Winnipeg branch demonstrate that it is advisable to increase the pipe as it comes through the roof. Suppose we are installing this increaser about 3 inches below the roof that would make it very difficult to install in an ordinary house. Whereas if it was 3 inches above the roof I think it would be an ideal terminal.

Mr. Swain, St. Boniface: Would it make any difference if there was a ring inserted around the increaser? There is some trouble to carry molten lead on the roof to make this joint. Wouldn't it be just as satisfactory to turn that lead down and put the ring inside?

Chairman: I believe that the Saskatoon committee make a suggestion that the ring be sprug in. I think that we should have something to prevent any sewer gas from escaping around the lead. The Saskatoon recommendation is a very good one, to spring the ring in, even though you put it on top of the terminal, but I don't think you can put it in more than 1 inch below the top.

Mr. Swain: I might add that on the C. N. R. roof in St. Boniface we have tried just flashing the lead inside the pipe, that didn't work very well and the contractors found that the ring helped out very much.

Mr. Nixon, Saskatoon: For a point of information I would like you to tell me how far below the increaser was placed.

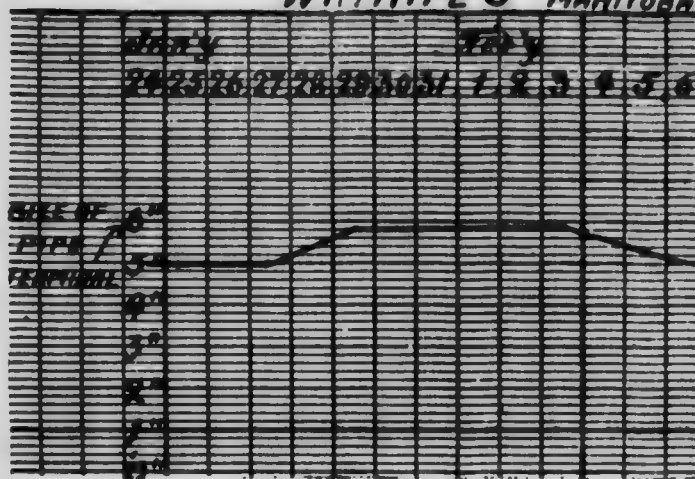
Chairman: You can see the increaser in the photograph.

On the motion of Mr. Huntbach the meeting was adjourned.

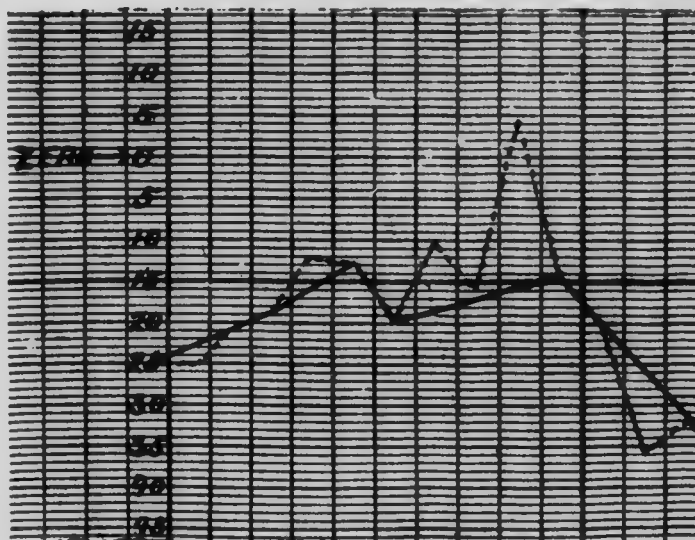


CH

TEST TAKEN AT CIVIC CURLING WINNIPEG MANITOBA



Showing closure by frost of a 6" soil pipe ter
pipe exposed above roof at high side and 7 inc
worked into hub and finished with a cast iron rin

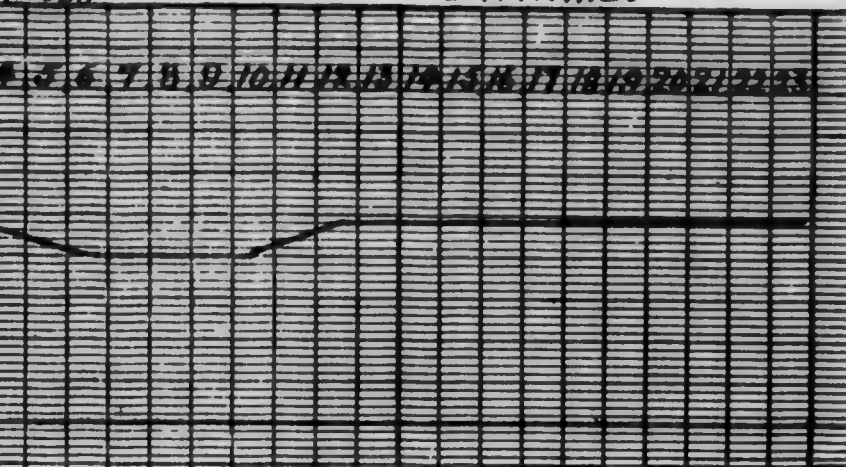


Daily minimum temperature indicated
Minimum temperature on days of inspect

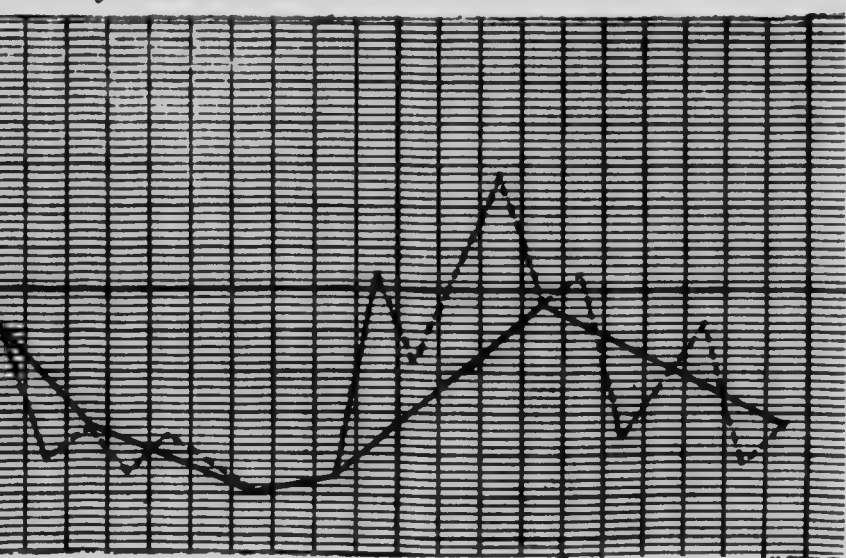
CHART I.

ROLLING RINK
MOTOR

SPECIAL PIPE
TERMINAL.



1. Pipe terminal, mid pipe cut down close to roof with 1½ inches of
and 7 inches at low side made weather-proof with a lead flashing
2. Iron ring caulked into hub.



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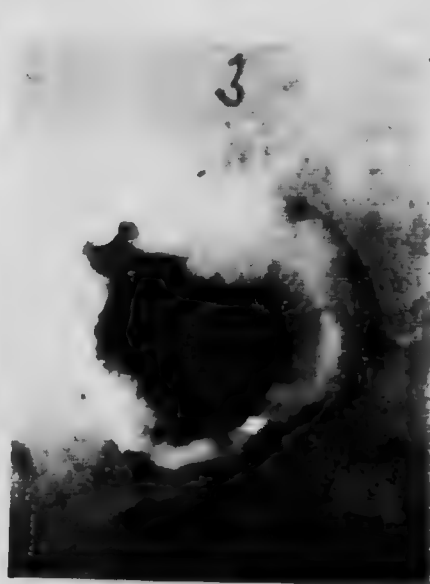
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Photos taken showing Ice Formation and Frost Closure on Soil Pipes

Pipe Terminal at Civic Curling Rink



No. 1 Elevation



No. 2 Plan

3rd February

Photos of Pipe Terminal at Civic Curling Rink
10th February

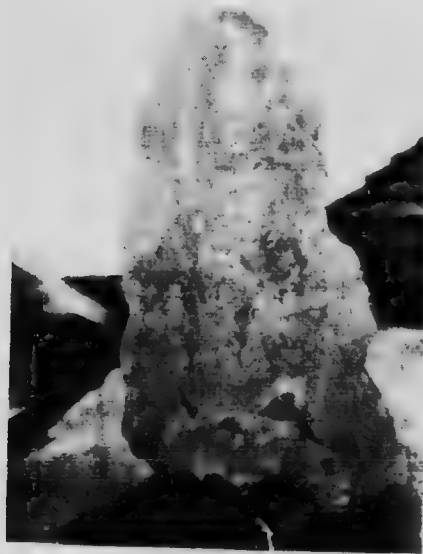


No. 3 Elevation

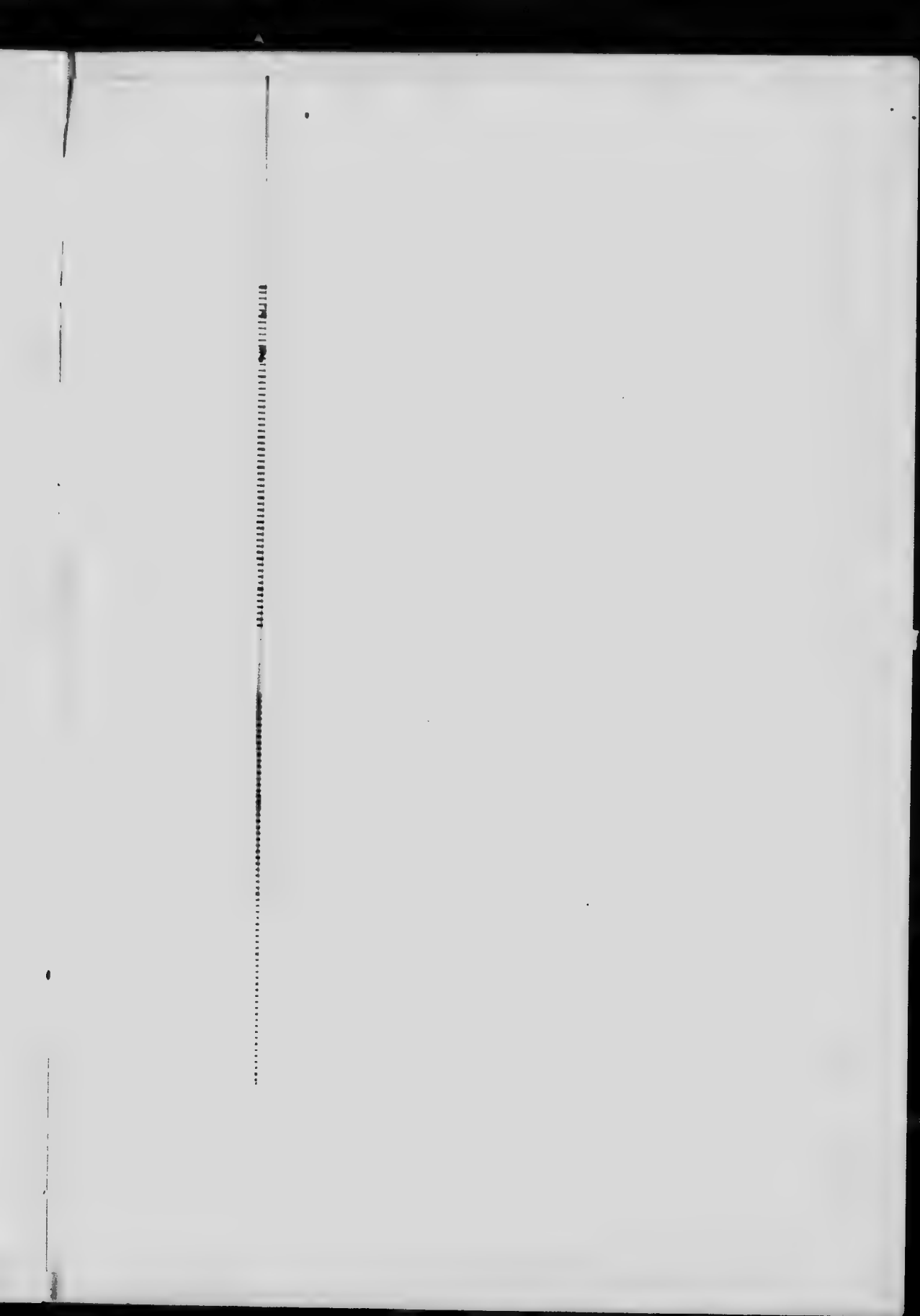


No. 4 Plan

25th February

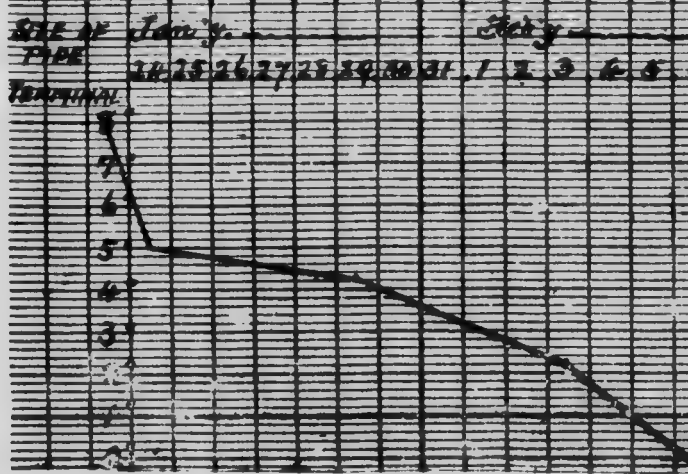


5th Elevation

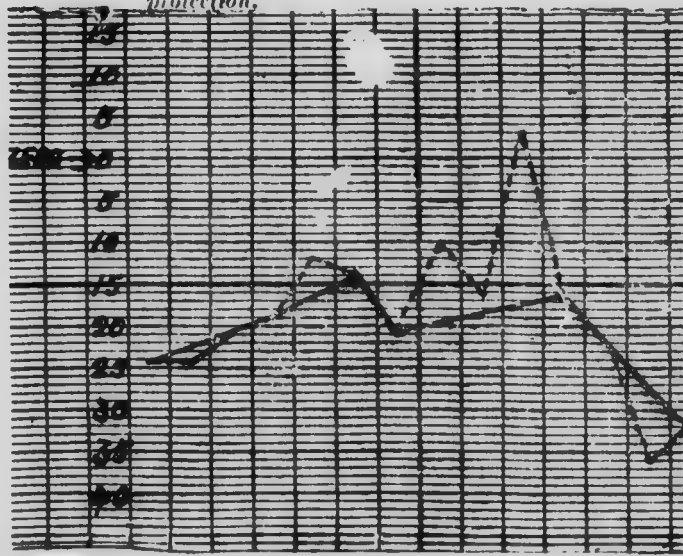


CH

TEST TAKEN AT GRAIN EXCHANGE WINNIPEG - MANITOBA.



Showing closure by frost of an 8" main soil pipe
protection.



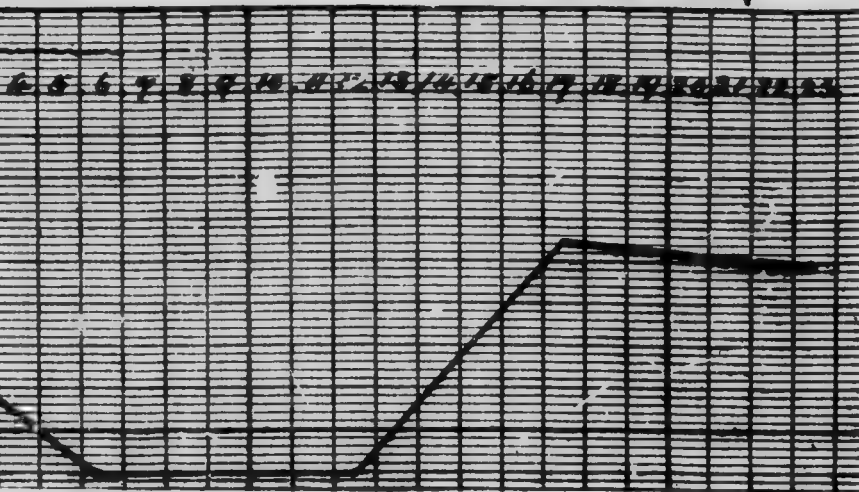
Daily minimum temperature indicated by
Minimum temperature on days of inspections

CHART II.

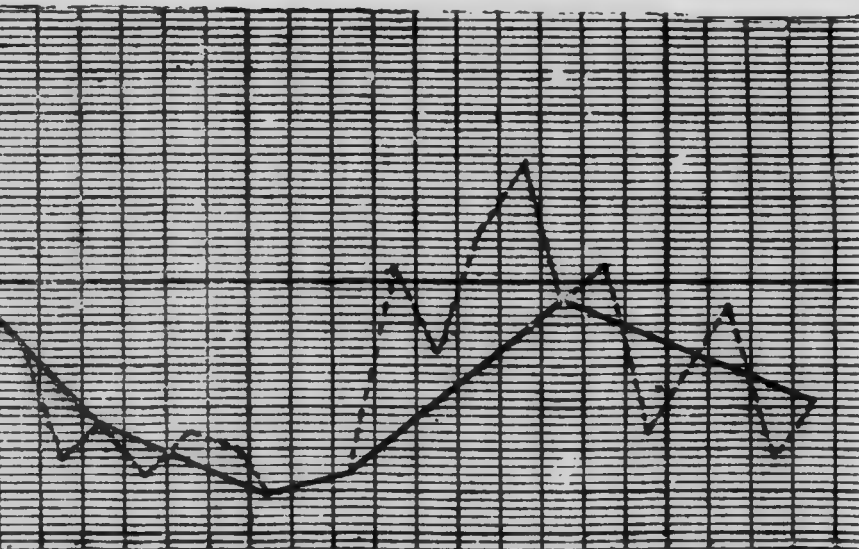
CHANGE

n.

.8 INCH SOIL
PIPE STACK



in soil pipe terminal, with 1 ft. of pipe exposed above roof, no



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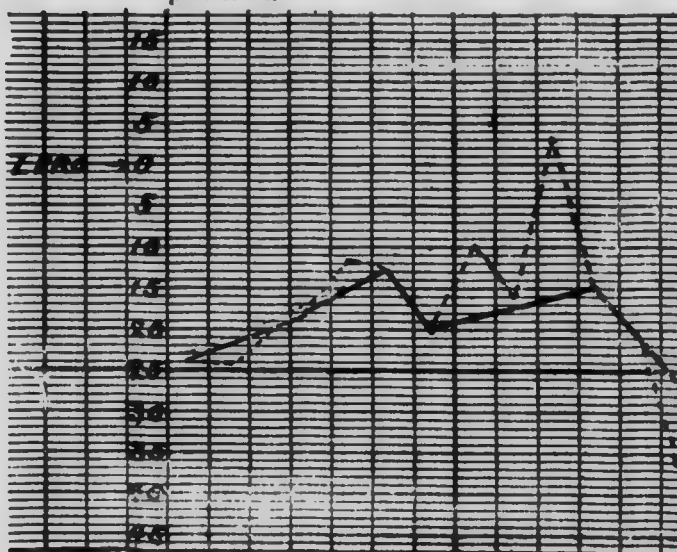


No.

TEST TAKEN AT GRAIN EXCHANGE WINNIPEG, MANITOBA.



Showing closure by frost of a 6" main soil pipe protection.

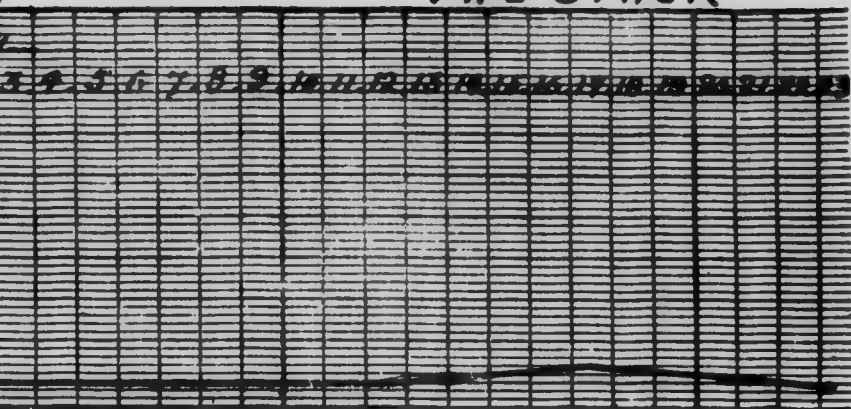


Daily minimum temperature indicated by
Minimum temperature on days of inspection

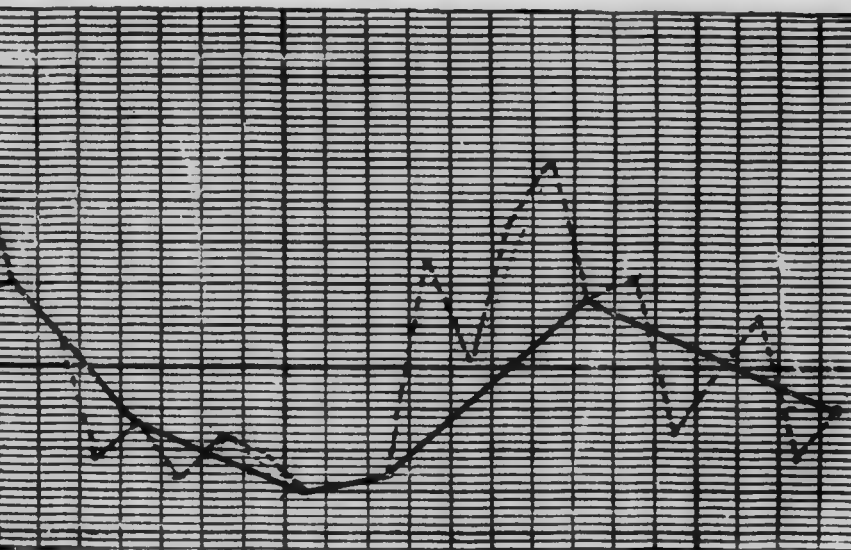
CHART III.

RANGE

6. INCH MAIN SOIL
PIPE STACK



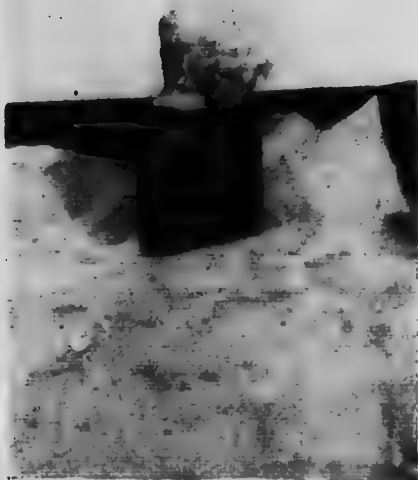
main soil pipe terminal with 1 ft. of pipe exposed above roof, no



indicated by -----
inspections —————



**Photos of Pipe Terminals shown on
Charts Nos. 2 and 3**



No. 6

**Elevation of Pipe shown on
Chart No. 2
taken on 3rd February**



No. 7

**Elevation of Pipe shown on
Chart No. 3
taken on 3rd February**

Photos of various Pipe Terminals on Grain Exchange

3rd February
3 in. pipe increased to 5 in.



No. 8
2½ in. above roof, unprotected



No. 9
12 in. above roof, protected with cap

10th February



No. 10
Same as No. 9 elevation



No. 11
6 in. stack, unprotected
7 in. above roof

Tuesday, May 5th, 1914, 10 am.

Discussion on "Pipe Terminals" resumed.

Chairman: In the Winnipeg recommendation it says that in all cases the vent pipe shall be taken up to the highest point on the roof.

Mr. Knechtel, Saskatoon: It resolves itself into the question of the gradual transition or changing of warm to cold air that would naturally take place if the fixtures were on the outside wall, and your vent stack offsetted in the attic from the eaves to the peak of the roof. You have that long vent pipe if your fixtures are on the side of the building and you have a gradual transition so that the moisture does not collect, if it is carried 14, 15 or 20 feet as it may be, what is the necessity of an increaser. Large buildings never have pitched roofs so I think my argument is strong. Take the case of a small building where the increaser has come up through the roof it comes pretty hard to get it through without making it unsightly. The Saskatoon committee have planned to bring in a recommendation to reduce the size of soil pipes to 3 inches, and increase same at the point of vent inlet from 3" to 4". If that fitting is put in, then that is all the increaser you need. I believe our committee decided that a 3 inch soil pipe would be sufficient for any ordinary house.

Chairman: Not wishing to interrupt your argument we are discussing terminals.

Mr. Knechtel, Saskatoon: I am trying to show there is no use of the increaser.

Mr. Ochampaugh, Edmonton: I have a 4 inch soil pipe without an increaser, with one of these old fashioned roof caps that taper out at the top. It was an accident I suppose, but the top of the pipe has quite a piece broken out of it in the shape of a V. It has gone down to 35 and 40 degrees below zero but I have never known that terminal to freeze over. It is possibly that "V" slit that keeps it from freezing.

Chairman: What exposure have you on that pipe Mr. Ochampaugh?

Mr. Ochampaugh, Edmonton: It is about 3 feet from the eaves and on the South side.

Mr. Taylor, Saskatoon: In connection with the conclusion we came to in regard to these terminals, a number of jobs in the town have been put in, that we paid particular attention to. They project two to three inches above the roof. There is less freezing over than when they were increased with the roof jack. When we took particular notice of these, we thought we were quite safe in coming to that conclusion. These stacks were installed 4, 5 and 6 years ago.

Mr. Fletcher, Calgary: I think if I had a black board I could demonstrate in regard to the warm air keeping the cold air away from the metal. The Saskatoon recommendation mentions the manufacture of a special fitting according to the drawing. That also shows the use of a lead flashing. I don't see why it is not just as sensible to use a short increaser. You can bring the increaser right into the roof. It is simply a stock fitting without any regard to the pitch of the roof. A flashing of lead on the lower side of the roof makes a protection to that particular point that comes above the roof more than the other. I don't see why we should consider the making of a special fitting when a stock fitting answers the purpose. Surely the increasing of one size will not make it necessary for a special fitting, and I would not advocate the manufacture of a special fitting when the ordinary fitting will answer the purpose.

Mr. Wharton, Winnipeg: I know from my experience that when there was no increaser going through the roof it was a more satisfactory job. I think if we increase the soil stack to 12 inches there will still be some freeze up. I agree with the last speaker and don't see why it is necessary to use a special fitting, but I would recommend that nothing less than 4" be used but don't see the reason for using 6".

Mr. Campbell, Medicine Hat: Have you a record of any tests made outside of the Winnipeg tests?

Chairman: We have nothing on record.

Mr. Beaton, Saskatoon: What is the length of the short stock increaser that is made now?

Mr. Anthes, Winnipeg: A 4" to 6" increaser is 9½" over all.

Mr. Beaton, Saskatoon: I maintain that the stock increaser that we can get would make an unsightly job. The ordinary dwelling house rafter is 4". Whereas if we don't increase it you go right up the wall and it is covered up.

Mr. Adams, Regina: In using that one size increaser there is nothing that shows in your house. There is nothing shown below your roof rafter. Your 4" is tapered from 4 to 6 inches below the roof line. In Regina we have installed quite a few with just the lead turned in but I think the ring in there would prevent any trouble.

Mr. Maxwell, Edmonton: I find in my observation on looking over the pipes coming through the roofs the 6 inch stack is not frozen while the 4 inch stack is frozen. I believe we should increase it. I believe we should have the ventilation proposition in this matter satisfactory. Where the pipe is frozen up you have no ventilation at all and I would advocate an increaser under the roof.

Mr. Bowcott, Edmonton: With regard to these experiments illustrated by the plans, were these two experiments carried on under the same conditions?

Chairman: The test carried the same period of time exactly.

Mr. Bowcott, Edmonton: I think we could not have a much stronger illustration. One is a 6 inch stack straight through and one an 8 inch. In this one chart the Winnipeg committee show that a 4 inch stack carried through the roof and furnished with a 6 inch increaser does not freeze up. This photograph shows me this is a fact. That is my argument, that the increaser at the top of any stack practically prevents that stack from freezing over entirely. You take two stacks that are taken through the roof without being increased and they are both frozen up. Where you have a 4 inch stack with a 6 inch increaser they have not frozen up. Having the increaser, the volume of cold air above the roof has the tendency to keep the warm air from coming in contact with the pipe. That is sufficient for us to recommend it.

Mr. McGrath, Saskatoon: We have had a lot of argument in regard to the cold air coming down into the increaser and keeping moisture from adhering to the iron. That might be alright in theory but I don't think it works out. We see time after time stacks that are frozen up. If this argument was right that cold air coming in over the pipe would stop that, how is it if you get up higher on the roof the lead that is put on there has not the same tendency to form frost as the iron hub has. The iron has more tendency to attract frost than lead. I don't think this works out. It might on an entirely still atmosphere. Just as soon as there is a little movement it carries this air over the stack, and then in half an hour the cold air goes down on the other side. This theory is no use to us because in 24 hours we have not got half an hour

where the air is still. We have no argument whatever to show where the increaser is any good. The only thing we say that has not been denied is, that it is better to keep the increaser close to the roof because it does not freeze up. Where the pipe continues above the roof whether with or without the increaser it freezes up. The only point where it does not freeze up is where it is close to the roof. I think the question comes down to this, keep the pipe terminal close to the roof. I do not think there is any reason for increasing. You are making a special fitting which is of no use. The manufacturers will tell you that it costs a little more to make this fitting because of having a slope on it. When you come to dress up a piece of lead where you have the pipe extending through the roof 4 inches or more it takes a mechanic to do it and it takes time to do it, a man could not do it in an hour and a half to two hours and do a good job, whereas if he simply has a piece of pipe extending through the roof 1 inch all around, he could do it in an hour and a half. I still maintain that our recommendation is a good one. There is one thing that we failed to insert and that is, a plumber should use a mixture of red lead and white lead to set the ring in tight and also to make a tight joint in the inside. This red and white lead will make a perfectly tight job.

Mr. Nixon, Saskatoon: You propose to make the increaser the terminal. If that flashing is going to hang straight down it is going to buckle, and if it is dressed back it is going to be a lot of work. Does that compensate for the difference between an ordinary increaser and this special fitting that we propose. It takes up the place of three fittings although the cost of this might be less than the standard increaser because you have two feet of pipe that is saved, which, in addition to the flashing suggested would do away with a lot of work. Mr. McGrath took up the question of the cold air coming down each side of the increaser and your photograph shows that it does. We claim still that it is impossible. If the pipe is the same diameter throughout the velocity of the outcoming air is not retarded and therefore there is no deposit. The only case in which we advocate an increaser is when the pipe is less than 4 inches in diameter, and then we keep the increaser right down below the roof. You get the deposit at that point on the warm pipe, and like the wet return of a steam pipe, the moisture will go down your soil pipe. When you decrease the velocity the deposit takes place. In light structured terminals you have the amount of radiation taking place greatly decreased, and therefore your air gets away before it is frozen. I notice in the Edmonton recommendation that the terminals on the roof should not be less than 10 feet from the side boundary of the lot. I think that is a very good provision. In Saskatoon we are getting a lot of trouble from that, the terminal of one building can be two feet from the next. In some cases they build right up to the next lot and stick their vent pipes there. I have been troubled when fixing roof caps on houses with the smell from the roof terminals on the next house. We have no traps on our sewers. We ventilate our sewers right through the plumbing system to the air above roof. I have no objection to that if the plumbing is tight.

Mr. McGrath, Saskatoon: We get away from so much iron at the roof and by putting in so much lighter metal it does away with so much lead. I believe we could make a hub lighter if we could use this ring sprung in, than if we had to caulk it.

Mr. Huntbach, Edmonton: I think a whole lot of argument is based on mere assumption. If Saskatoon had tried out this plan it would

have proved that certain things would have happened. Our experience in Edmonton has been that where you cut the pipes off right at the roof they were not frozen up. Since we have adopted the increaser we have had practically the same results. I don't know whether I favor the increaser or not. If there is no difference by using the increaser, there is no reason for putting it on. However we have not tried it on a pitched roof. If Saskatoon could have tried that plan and got results we would have had something to work on. Again I would like to ask Mr. Fletcher if he has ever tried the smoke test to see if there was that induction he speaks of, caused by the internal velocity at the terminal.

Mr. Swain, St. Boniface: There has been a lot of discussion about the increaser. If we do not use an increaser we will have to come down to something definite. In St. Boniface we have had our 4 inch pipes extended from 2 inch to 13 inch and 15 inch above roof. We find that the higher the pipe is carried above roof the quicker it freezes up. We have 4 inch pipe flush with the roof and 4 inch pipe with the increaser. Now referring to the gentlemen talking about what air comes back into the pipe I know that in the electrical business this condition takes place, the gas coming must have a gas behind it. From my way of putting it I know it acts electrically on the pipes in ice houses. The fact is that you can take a bottle and fill it up with water, tightly cork it up and take a considerable amount of water out of the bottle by condensation. There has been a provision made for lead flashings, but their use on copper and galvanized iron roofs causes an electrical action which eats away the copper. It is something that I would like to know how you are going to get over. We at St. Boniface are heartily in favor of the increaser. I would like to see the gentlemen who are living in a more tropical climate concede this to us.

Mr. Maxwell, Edmonton: They say that sewer gas is not dangerous. There was a family in a village back East and they all died but one and he concluded to have his house overhauled and I was selected to have it done. I found they had basins in every room and there wasn't a trap under any fixture. They all died with typhoid fever with the exception of one. They had a tank in the basement for rain water and I lined that tank with copper. I went there the next morning and that copper was turned black. Was it from sewer gas or was it from poison? These scientific fellows say there isn't any danger in sewer gas, I am satisfied there is. Straight across from the job I worked on there was a 6 inch terminal frozen right over.

Mr. Ochampaugh, Edmonton: Chairman, I would like to have your views on the terminal question as you were chairman of the Winnipeg committee.

Chairman: We have a few 4 inch stacks terminating close to the roof with a lead flashing, having a southern exposure that were not frozen but we didn't consider them as we took all our tests on Northern exposures. These pictures demonstrate that a great deal depends on the exposure. Moisture constantly freezes and falls over on the side where the wind is blowing. On this picture here, you have quite a bank of snow that took two or three days to build up prior to the day we took the photograph. My own opinion is that we need the increaser. It is only a question of time, a 4 inch pipe takes a certain length of time to freeze over; a 6 inch a little longer and an 8 inch still longer. That is the only conclusion that we can come to. In our experiments and observations there may be some points that have not been brought out as far as the Winnipeg committee is concerned, but I think we cover the

ground fully. As it takes longer for a 6 inch pipe to freeze over than a 4 inch. Will it take longer to thaw it? We have it here, on Charts No. 2 and 3. They are on the same building on a flat roof and under the same conditions. The 8 inch pipe took from the 24th of January when there was a 5 inch opening until the 5th of February when it was closed up. It took 13 days to close up that 8 inch pipe. It remained closed for 6½ days and in direct ratio with the rise of temperature it started to open up. It took 6 to 7 days to open up to 5 inch and it remained there until the temperature went down, that is the 8 inch pipe. On the 6 inch pipe it took about 5 days to close it up and it practically remained closed for the rest of the month's experiment.

Mr. Lamson, Winnipeg: Was there any measurements taken with reference to the velocity of the sewer air, or the amount of moisture?

Chairman: No.

Mr. Lamson: Then could that be taken without that question. I saw tests of different classes of material with pressed steel radiators and cast iron radiators. There was practically no difference in the condensation. As far as the metal is concerned it depends entirely on the experiments that were made. At the University of Michigan it was found that it depends on the exposure. So I would think that to make a practical test it would have to be made by taking into consideration the velocity of air and the amount of moisture.

Chairman: You understand that it would make it much more complicated and much more difficult to carry out. We consider when we made that test that we were making a practical test; that we were making a comparative test under the most favorable circumstances that could be found in the City of Winnipeg.

Mr. Lamson, Winnipeg: You can't take the velocity of one stack as being the velocity of the other.

Chairman: I don't think that would make very much difference, it was in a building without any baths, and fixtures such as in houses that would create steam.

Mr. Lamson: We could take it for granted that there were only six basins on the flat, I think the percentage of moisture on one would be 75 per cent of the other. To make a real practical test on a basis where you would know it was right you would have to measure the velocity of the air and moisture, that would be a practical test.

Chairman: It is a very good suggestion that we make more scientific tests. I believe it will be more reliable. We have been doing our best to get practical tests made. We hope before very long to do as they are doing in the American Society. They have recently installed an experimental station in the University of Illinois and they hope by this means to get a scientific investigation.

Mr. Lamson: If that is the case I would suggest that the local Association take up this matter of scientific investigation. I think it would be a good thing to start with.

Mr. Smith, Edmonton: We asked you a question of how long it would take to thaw out a 6 inch stack. When your 4 inch stack is not increased it is frozen over. In a 4 inch stack you have not as much space for frost to gather and therefore I think it thaws out quicker. Therefore I think that an increaser is good again. When it thaws a little it drops down to where the increaser stops and stays there and melts gradually.

Mr. Nixon, Saskatoon: I would like to ask Mr. Lamson if he really thinks there is any analogy between a roof terminal which has only

natural heat and the information he gave us in regard to radiators. I think he is wrong. There doesn't appear to me to be any analogy between the two.

Mr. Lamson, Winnipeg: In answer to that question I might state with reference to the condensation it is due to the same radiation. The radiator will condense a certain amount of steam according to the external temperature. Sewer air would be about 100 degrees, it would depend entirely upon the amount of hot water that was going through the pipe. There is no question that from every foot of pipe you have above the roof you get radiation. There is no question but that the roof terminal that is close to the roof will condense less moisture than the longer one.

Mr. Nixon, Saskatoon: I still claim there is no analogy between the terminal and the radiator.

Mr. Lamson, Winnipeg: The steam comes into contact with the external air to a certain extent. I think it is condensation with both. It is moisture in the atmosphere and steam in the radiators. The only practical way to make a test is to measure the velocity of the air and moisture.

Mr. Wharton, Winnipeg: My point of argument is this that 15 or 18 years ago when we were using a galvanized iron flashing we had some that were frozen up and we had some that did not freeze up. We introduced the increaser, but we now find that it does not work. We are at the point of the game where we were 10 years ago, we are discussing the question whether it is reasonable and whether it is necessary to increase the terminal. I believe to settle this thing now it would take the whole length of this convention to cover this one question.

Chairman: We will not do that.

Mr. Mathias, Regina: It is very clear that the terminal at the roof level is pretty generally agreed upon by everyone. Then the question is brought down as to whether they should be increased. I believe the increaser at the roof level is necessary. There are many things to be taken into consideration and the experiments which you have made are conclusive enough, and we might go on and find out more by experimenting. It is possible that the temperature is lighter here than in Winnipeg for that reason I would ask that we suppress any local feeling. It is not a matter of every man wanting his point. I think we will be doing the best thing to be in favor of the low level and the increaser. Now gentlemen, Mr. Lamson, said something that is very important and very necessary. There is no doubt in my mind that the increaser acts very similar to a radiator. You must consider that heat has to be measured when you get the temperature down below 32 degrees, it is not a matter of cold air any more than it is a matter of heat units being taken up. No matter how many experiments you make or whether you use a thermometer, I don't think you would ever arrive at a more conclusive result than that shown by the photographs. With regard to the question as to the difference of the conditions under which the 6 inch and 8 inch pipes stood on that roof. I don't think it is a question of how much more hot water was put in one than in the other, they are sewer ventilators and you may take it that the temperature of the sewer is just about the same as the air that comes out of the pipe. I don't know that it is competent to say any more. It appears to me with regard to the terminal being carried within three feet of the ridge that you have been taking it for granted that that ridge is at right angles with the street line; that might bring you within 4 feet of the next lot. That requires

a little consideration. It appears to me to be better to have it stated that it must be so many feet from the adjoining lot line. It should be insisted that there be no windows within a reasonable distance of the terminal. Anyway, I think we have sufficient discussion on this matter as there is so much to come before the convention. We should have that standard By-Law. If you discriminate between the far East and the locality represented by yourself you will not be living up to the aims of the Institute. I ask that any local feeling be sunk and that we proceed to vote. I say that we have had enough debate on this question.

Mr. Fletcher, Calgary: I make a motion that we take the Winnipeg resolution. There has been one or two questions fired at me. Mr. Huntbach asked me if we had any experiments made with the increaser. I may say that my own house which was installed with the hub coming flush with the roof and a small extension put into it, I had to remove that extension and I left it with the hub flush with the roof, which increased it. That opening used to close part of the time but since removing that extension I have yet to see it closed. I would like to press this motion if I can get a seconder.

Mr. Nixon, Saskatoon: I would like him to incorporate two things in that motion. I am pretty well converted to the ordinary increaser. I believe that hub coming up and out acts as any other hub, it breaks up the wind. I believe it assists the terminal in that photograph, where you show the lead beaten tightly back to the increaser. It shows less frost. I admit I spoke unscientifically when I said the iron only had its natural heat. What I should have said was "specific heat". Everything has specific heat more or less. Mr. Mathias said iron had heat and it was always giving it away. My argument is that it is very unlike a radiator that has steam condensing in it. That recommendation from the Edmonton committee that all pipe terminals shall be at least 10 feet from the boundary of the lot is a good one.

Mr. Fletcher, Calgary: I will object to the last gentlemen's recommendations. I believe the beating back of the lead to the hub is unnecessary, I don't think it is practical. I would consider that it was better if the flashing is dressed in rounding form as it leaves an air space between the lead and the hub. The ordinary mechanic will leave a hole in his lead if he attempts to dress it close to the iron. Our experience in this country is that mechanics can't beat lead, I know I can't and I would object to the beating back, in fact I think it is a detriment.

Mr. McGrath, Saskatoon: I have a substitute motion that a committee bring in a recommendation a few minutes after lunch.

Chairman: Mr. Fletcher, are you willing to withdraw in favor of this motion?

Mr. Fletcher, Calgary: I am willing to withdraw if the convention will agree to voting on it without any more discussion.

Chairman: Mr. McGrath, are you willing to incorporate that provision in your motion?

Mr. McGrath, Saskatoon: Yes, Mr. President, and make it a committee of five and Mr. Fletcher as the Chairman and that no further discussion be allowed.

Mr. Knechtel, Saskatoon: I second the motion.

Chairman: The motion before us is by Mr. McGrath, and seconded by Mr. Knechtel, that this matter be referred to a committee to bring in a recommendation shortly after lunch.

Mr. Fletcher, Calgary: I would just as soon not be made chairman of that committee as I have already indicated what my sentiments are.

Before you go any further will you set out how this vote is to be taken.
Chairman: One from the Master Plumbers, one from the Journeymen plumbers and one from the Inspectors of each City.

Motion carried.

A motion to adjourn is now in order. Your committee will be Mr. Mathias, (Chairman) Mr. McGrath of Saskatoon, Mr. Ochampaugh, Mr. McFarlane, and Mr. Fletcher.

May 5th, 1914, 4 p. m.

Chairman: We will now call on the committee to bring in their report on "pipe terminals".

Mr. Mathias, Regina: We have given this as much consideration as we could in the time we had. We have not drafted it in the proper words but we have come to the conclusion that the 4 inch terminals be increased one inch and that all terminals less than 4 inches shall be increased to 4 inches and that they shall be bevelled to the pitch of the roof and that the lead flashings should be caulked. We are of the opinion that the terminals should be at least 10 feet from the nearest lot line. That is the sense of the conclusion we have arrived at. We thought it better to leave it in this form and have it properly drafted in legal words.

Mr. Beaton, Saskatoon: Mr. President, may I ask a question as to the bevel of the roof, what is the meaning of that, does it mean that you have to cut off the pipe?

Mr. Mathias, Regina: It means that the higher and the lower sides will approximately be the pitch of the roof.

Mr. Bowcott, Edmonton: It is practically the same as the Saskatoon committee's recommendation.

Chairman: That is what it practically means. Beveling that part of the pipe at the terminal.

Mr. Bowcott, Edmonton: It means that you will have to cut off the pipe to the pitch of the roof.

Chairman: No, it will be a special fitting.

Mr. Ochampaugh, Edmonton: We simply have an increaser with a bevelled top.

Mr. McGrath, Saskatoon: This increaser will be short on the low side and on the high side it will be longer in proportion to the pitch of the roof. To make that job tight you will finish it with a wrought iron ring. The lead being turned in and made tight with white lead or any means that may be suggested to make it tight.

Chairman: The motion included that there was to be no discussion.

Mr. Wharton, Winnipeg: As a point of information I would like to know what kind of fitting the manufacturers are going to make to suit the various roofs that we are going to contend with. We come into contact with so many small houses with no set pitch. What kind of fitting are we going to get to suit all pitches of roofs.

Chairman: I am afraid I will have to ask the chairman of the committee to answer that question.

Mr. Mathias, Regina: It would not be necessary to have more than three. It has been shown that it would be possible to make a fitting which could be cut at an angle, the angle of incidence and the angle of

reflection, would be equal. I take it that three will be ample to meet any pitch.

Mr. Campbell, Medicine Hat. Suppose the manufacturers were making an increaser just as they have been doing only say with a groove on the hub. The groove could be placed so we could chop it off to suit the pitch of the roof, as a soil pipe is cut off with a chisel. On the same plan as the "Jar-U" bend.

Mr. Rodgers, Calgary: How do you figure on getting the ring so you can caulk it in?

Chairman: I am not sure whether it is intended to cut a special pipe or whether it is intended to use an iron band.

Mr. Ochampaugh, Edmonton: Our idea was to have the wrought iron ring cut by the manufacturer or by the master plumber. It could come with the increaser.

Mr. Nixon, Saskatoon: It seems to me that if two terminals were made together, they could be cut at any angle with a milling machine.

Chairman: I think there has been enough discussion.

Mr. Huntbach, Edmonton: I am going to move the adoption of this report, and that it be put in legal phraseology.

Mr. Gothard, Wetaskiwin: I second this.

Chairman: Are you ready for the question?

Mr. Mathias, Regina: As a point of order, I think you will have no option. I think it was intended that the decision of the committee was to be accepted.

Mr. McGrath, Saskatoon: The motion was that we were to bring in a recommendation which was to be voted on by the representatives.

Chairman: All in favor of the motion? Only those having power to vote as based on the decision arrived at, in the morning session will vote on this.

The motion was carried.

Pipe Terminals.

All soil, waste and ventilating pipes, shall be located inside the premises, and shall not be placed inside an external wall of a frame building and all terminals of such pipes shall be located not less than 10 feet distant from, or two feet above any opening window, door or other opening in the building and shall not be located closer than 10 feet to the lot line of premises. All terminals of soil, waste and ventilating pipes of 3 inch, 4 inch and 5 inches, shall be increased 1 inch in diameter and all under 3 inches shall be increased to 4 inches before passing through the roof, by means of an increaser which shall conform as near as possible to the pitch of the roof, and shall project to the outer air not less than 1 inch and not more than 3 inches above the roof and be made weatherproof by means of a lead flashing. All such lead used for this purpose shall be in weight at least 5 pounds per sq. ft. and shall be worked over and into the hub of increaser at least 1 inch with not less than 5 inches of cover on the roof on either side of the pipe terminal, and shall be finished with a cast or wrought iron ring properly caulked with lead or oakum and red-lead into the hub thereof.

Chairman: You have all had the recommendations before you on the "sizes of soil, waste and vent pipes". If it is your will and pleasure we will go on under that heading.

Mr. Swain, St. Boniface: I make a motion that a committee be appointed to bring in a recommendation.

Mr. Ochampaugh, Edmonton: I take pleasure in seconding that

motion, as we have had too much discussion on the other subjects, and it isn't one iota to what this would be.

Chairman: How many would you suggest having on the committee?
Mr. Swain, St. Boniface: Five.

Mr. Maxwell, Edmonton: Don't you think that this committee that you will appoint should be acquainted with the conditions?

Chairman: We will have to vote on that just as we did on that other question.

Mr. Nash, Edmonton: I suggest that this committee's report be final and that there be no discussions.

Chairman: I don't think I could entertain your suggestions Mr. Nash. I have no doubt the committee that I will name will bring in a recommendation satisfactory to the convention.

Mr. Nash, Edmonton: If it is not made that way we might just as well go into the clauses now.

Chairman: It is moved that a committee be appointed to report on the "Sizes of soil, waste and vent pipes" to report tomorrow morning.
Motion carried.

I would like a little time to consider the appointing of this committee.

We will now proceed with the "Standardization of pipes and fittings". With your permission, I would like to suggest that our secretary who has devoted considerable time to this question and has had a number of drawings made introduce the subject, there are also a number of drawings by the Saskatoon delegation. I would also like to suggest that the article that appeared in the 15th of April issue of the "Sanitary Engineer" be read. If it is agreeable I will call on Mr. McFarlane to read that article.

(Mr. McFarlane reads article in "Sanitary Engineer").

Standardization of Cast Iron Soil Pipe and Fittings.

Is there a call for it? I think it will be conceded by not only those present here, but by all connected, directly or indirectly, with the installation of plumbing, that there is a decided call for standardization in the construction of pipes and fittings relative to diameters of pipes and hubs, radii of bends and offsets and length of spigot end of all fittings.

With the idea of gathering some data for the work placed upon us as a committee on standardization, we visited the several wholesale supply houses, taking notes of the different makes of pipe and fittings. In this I may say we were disappointed, as, while each manufacturer's own make of pipe and fittings fitted fairly well, we found discrepancies in the sizes of the various makes of pipes which make it difficult to combine one maker's material with another, should the necessity arise, as it has done in the past, through scarcity of fittings and other reasons to do so. Taking 4 inch pipe alone, we found it varying from 1/16 to 1/4 less than 4 inches in diameter: in fact, at the time our visits were made there was only one pipe in all we measured which was up to size.

With regard to fittings, we found a number where the body of the bend or branch was of medium weight, while the hub was of standard weight. In another instance we found on comparing two T. Y. branches one marked "X.H." and the other marked "Med." The medium seemed the heavier of the two, and when placing the "Med" into the hub of the "X.H." we had a tighter joint than when we reversed them.

Finding no assistance under these conditions, we decided to work out our own sizes, and in this connection we are indebted to the valuable assistance derived from a paper delivered by R. R. Rust of the American

Society of Plumbing Inspectors at their convention in Milwaukee, 1911. When discussing the subject, there were several leading points we decided upon, viz:—

- 1st. A uniform lead space in all joints.
- 2nd. A sufficient thickness of wall in hubs to resist caulking strain.
- 3rd. T.Y. branches as far as possible to be on the T. and Y. principle, especially those 2 inches and less in diameter.
- 4th. All bends and offsets to have an easy radius.
- 5th. All fittings to have sufficient length at spigot end to allow the joint being properly caulked, a point which is very essential when you consider that the bulk of the leakages found on inspection arise from the fact of this part of the fitting being too short, thereby making it difficult to caulk the joint properly in the throat of the fitting.

Regarding Durham or Recessed fittings for wrought iron pipe, we deprecate the use of the short branches and quick bends much in vogue at present, and advocate the use of long sweep bends and T. and Y. branches.

As to bends at foot of stacks, we recommend the use of a long sweep bend, finished with a hub, which, if necessary, can be extended to floor level with a short piece of pipe, a cleanout being caulked into pipe at floor level. This bend, if thought necessary, may have a heel rest cast on same for the purpose of supporting the stack.

In preparing our tables we decided to deal only with diameters, radii of bends and length of pipes and fittings, leaving weight to take care of itself, as we considered that weight was something that could be added or removed at the makers discretion to make it conform to the standard, and not always to the advantage of the fitting.

We have prepared a number of drawings embodying all the foregoing points, and which we now submit for your approval.

As a specification for cast iron pipe we beg to submit the following:—Section 55 of By-Law to read:—

All cast iron pipes and fittings must be true to drawings shown, sound, free from cracks, sandholes, blowholes and cold shuts. No filling with metal, cement or other material, or burning on of iron to be permitted.

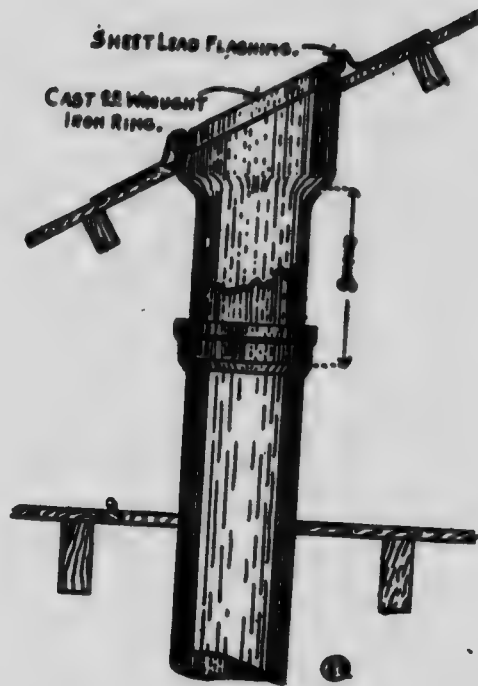
The inside diameter of the barrel shall not be less than $\frac{1}{8}$ of an inch less than the normal size of same. The wall thickness shall be uniform showing no greater variation than $\frac{1}{32}$ of an inch in "X.H." pipe and $\frac{1}{64}$ of an inch in "Med." pipe and at hub and spigot end to present a true circle.

The bore shall be smooth and free from fins, ridges and adhering sand, and except for unavoidable irregularities the full nominal bore must be maintained.

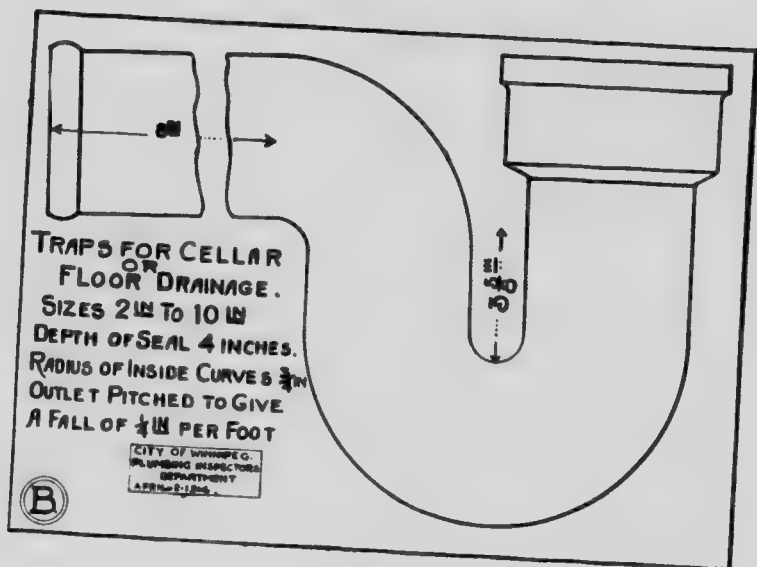
The iron used in their construction to be of such a quality as will admit of easy cutting with file or chisel. All pipes and fittings shall be thoroughly coated inside and outside with coal tar, pitch or oil, and shall have the manufacturer's name or trade mark and whether "Med" or "X.H." clearly stamped on hub thereof.

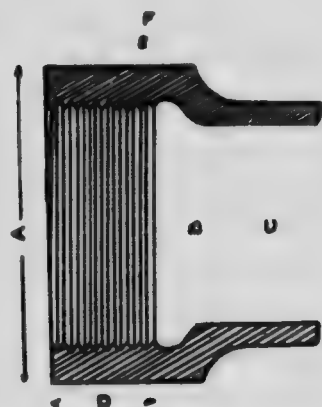
Section 57 of By-law, 3rd sentence to read:—

"All fittings for waste soil pipes and rain water leaders shall be of heavy cast iron, recessed and drainage fittings with threads tapped to give a uniform grade to branch pipes of at least one-quarter of an inch to the foot and shall be true to drawings shown."



"Pipe Terminal"
adopted
by Convention
see pages 28 to 45





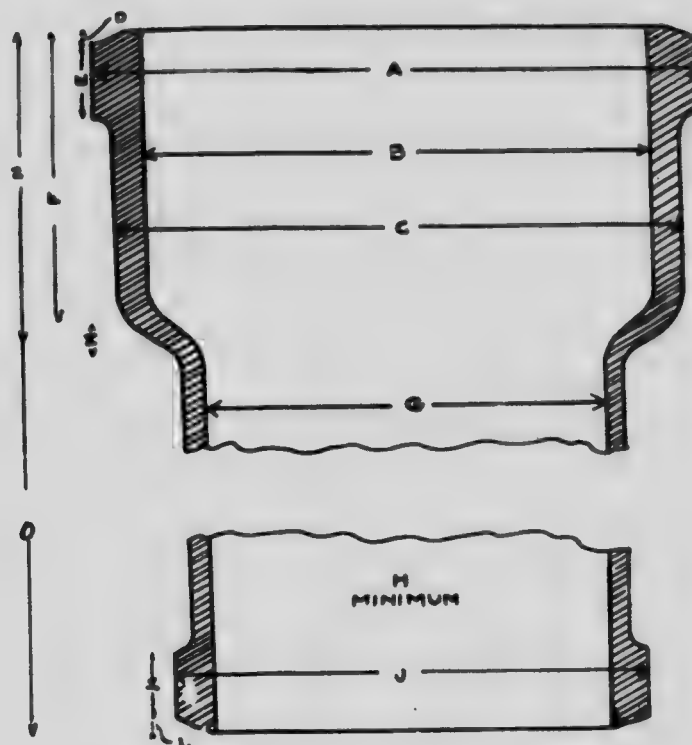
DETAILS FOR TAPPED BOSS FOR WASTE FITTINGS

Size	A.	B.	C.	D.	E.	F.	G.
1 1/2"	3 1/8"	2 1/2"	2"	1"	1 1/2"	2"	1/2"
1 3/4"	3 1/2"	2 3/4"	2"	1"	1 3/4"	2"	3/4"
2"	3 3/4"	2 7/8"	2"	1"	1 7/8"	2"	1"



DETAILS FOR TAPPED BOSS FOR VENT FITTINGS

Size	A.	D.	H.
1 1/2"	3 1/8"	1"	1/2"
1 3/4"	3 1/2"	1"	3/4"
2"	3 3/4"	1"	1"

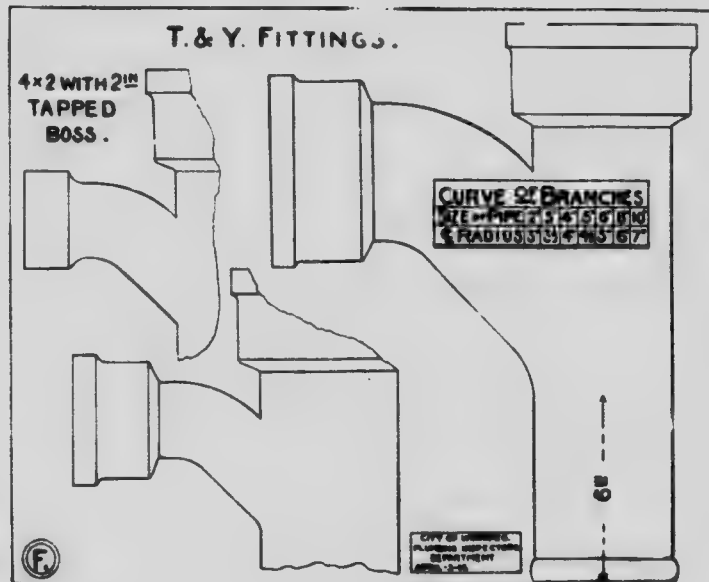
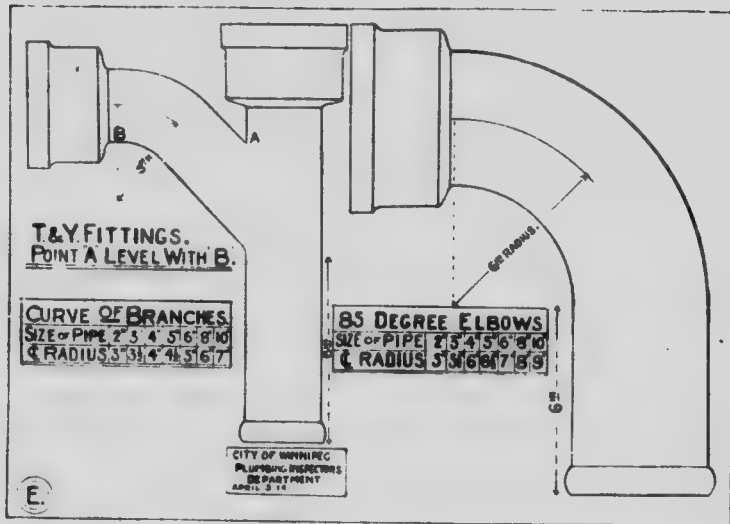


DETAILS OF CAST IRON PIPE AND FITTINGS

Size	A.	B.	C.	D.	E.	F.	G.	H.	MIN WALL	J.	K.	L.	M.	N.	O.
MEDIUM															
2"	4 1/8"	3 1/8"	3 1/8"	1 1/8"	1 1/8"	2 1/8"	2"	2 1/8"	1/8"	2 1/8"	1 1/8"	1 1/8"	1 1/8"	1 1/8"	60
3"	5 1/8"	4 1/8"	4 1/8"	1 3/8"	1 3/8"	2 3/8"	3"	3 1/8"	1/8"	3 1/8"	1 3/8"	1 3/8"	1 3/8"	1 3/8"	60
4"	6 1/8"	5 1/8"	5 1/8"	1 5/8"	1 5/8"	2 5/8"	4"	4 1/8"	1/8"	4 1/8"	1 5/8"	1 5/8"	1 5/8"	1 5/8"	60
EXTRA HEAVY															
5"	7 1/8"	6 1/8"	6 1/8"	1 7/8"	1 7/8"	2 7/8"	5"	5 1/8"	1/8"	5 1/8"	1 7/8"	1 7/8"	1 7/8"	1 7/8"	60
6"	8 1/8"	7 1/8"	7 1/8"	2"	2"	3"	6"	6 1/8"	1/8"	6 1/8"	2"	2"	2"	2"	60
8"	10 1/8"	9 1/8"	9 1/8"	2 1/8"	2 1/8"	3 1/8"	8"	8 1/8"	1/8"	8 1/8"	2 1/8"	2 1/8"	2 1/8"	2 1/8"	60
10"	12 1/8"	11 1/8"	11 1/8"	2 3/8"	2 3/8"	3 3/8"	10"	10 1/8"	1/8"	10 1/8"	2 3/8"	2 3/8"	2 3/8"	2 3/8"	60

CITY OF WINNIPEG
PLUMBING INSPECTORS
DEPARTMENT.
APRIL - 2 - 1914 -

(A)



In connection with the drawings shown, these are just a few of those that were prepared, the complete set are on the wall, and I daresay the most of you have made yourselves familiar with them. The first drawing shown here gives details of wall thickness and dimensions of pipes, hub and spigot end.

At our last convention we decided to have medium weight pipe for all four inch pipes and under, above 4 inch to be "X.H." and the tables shown here have been prepared on that basis. On all medium pipes we propose to adopt a wall thickness of three-sixteenths of an inch, and on "X.H." five inch to six inch pipe a wall thickness of one-quarter of an inch and on eight inch to ten inch a wall thickness of five-sixteenths of an inch. On all hubs up to 6 inch pipe, medium and "X.H." alike, we propose a wall thickness of five-sixteenths of an inch and above six inch a wall thickness of three-eighths of an inch, with a caulking space of five-sixteenths of an inch in all hubs. On the spigot ends of all fittings we recommend a straight length of pipe six inches long, this is about two and one-half inches longer than at present, and on traps owing to the square construction of outlet we recommend a straight spigot end eight inches long. T.Y. fittings, we recommend what we might term a half T. and Y. on one-sixteenth and one-eighth bends we adopt a four inch centre line radius, on one-sixth bends a five inch radius and on one-quarter or square bends a six inch radius. I think that fairly covers the ground, as for the rest, the drawings speak for themselves.

Mr. Swain, St. Boniface: I move that the report of the committee be adopted.

Chairman: It wasn't a committee to bring in a report, it was a committee formed by the Winnipeg branch only to make those recommendations for discussion, I would be very sorry to see a motion made in this way. We realize that there will be a number of modifications required to be made on those drawings before they are acceptable, and a number of them could be altered so that a great deal of economy could be made in their manufacture. In many other ways I think it would be a pity to bring in a motion to adopt it at this convention. It is a matter that will take years to perfect. We only bring this in to get the discussion started, realizing that it will be several years' work before they can be manufactured and used in this Western Country.

Mr. Taylor, Saskatoon: Do I understand that it will take years to arrive at any conclusion on any of the fittings that we desire to use?

Chairman: No, not any individual fitting. It may be done by this convention, but it will take a long time before arrangements can be made for their manufacture.

Mr. Taylor: If some of these drawings are workable and a benefit to the trade can we not get busy and get those fittings out?

Chairman: You can get individual fittings made, but I wouldn't like to see the whole recommendation adopted now.

Mr. Lamson, Winnipeg: I have been listening to the argument on these various fittings and think it would be a splendid thing at this convention to standardize on one or two of these fittings, and every succeeding convention add to them. It would be a hardship on any manufacturer to manufacture patterns for an entire line of new fittings at any one time, but by taking up one or two fittings it wouldn't work a hardship on the manufacturer and at the same time show that there was something being done on the fittings by this convention. The manufacturers could be requested to submit samples to a committee that would have the power to agree upon them.

Chairman: Mr. Lamson has put into better words what I was going to say to you. The first thing to get standardized is the pipes. If we can standardize the pipe and possibly three or four fittings it will be a benefit.

Mr. Taylor, Saskatoon: There is more trouble in the irregular soil pipe than there is in the fittings. I am in favor of standardizing the soil pipe first and then we could bring in the fittings later on.

Mr. Vallance, Lethbridge: Do I understand that the question of weight is not going to be taken into consideration?

Chairman: No, the wall thickness will be the paramount consideration.

Mr. Nash, Edmonton: I rather think you will have a difficult task on your hands when you tell the manufacturers that you want a pipe of the same thickness on every side. Sometimes I have cut pipe that on one side was one-sixteenth of an inch and the other side was one-quarter of an inch.

Mr. Lamson, Winnipeg: I think Mr. Anthes could answer that question quite well.

Mr. Anthes, Winnipeg: I think if standardization is carried out it will be a fine thing. A great deal of trouble is found with American pipe, it is made so they can get a pipe 45 pounds in weight but it is from one-eighth of an inch to one-quarter of an inch short on diameter. If it was stated that all soil pipe be made not less than four and three-eighths inches on the outside I think we could get out a soil pipe that would be satisfactory. If a little too much is taken off the core the inside is going to be larger. In making this recommendation I would specify that the external diameter should be four and three-eighths of an inch and allow no variation from that. You can make a provision allowing them 1-32 of an inch to 1-16 of an inch on the inside diameter. These are two points I would enforce. That is, there should be no variation from 4 3/8 of an inch on the outside and the inside measurement should be at no time greater than 4 inches. I think you will find very little difference in the weight of the 4 inch pipe. I think it will come to 45 pounds.

Chairman: I would like to ask you about the hub.

Mr. Anthes, Winnipeg: As far as the manufacturers are concerned it will make no difference, that is a question to be decided upon by the convention. Of course, the greater the diameter at the top of the hub the more lead and oakum you will have to use. That is a point you will have to decide. As far as the weight is concerned I think it is a good thing to have it standardized.

Mr. Lamson, Winnipeg: I think that Mr. Anthes has really answered the question. I was expecting him to say, however, something about the core being supported to keep it from sagging.

Mr. Anthes, Winnipeg: That is a point in manufacture. As long as the sand is lighter than iron just so long will you have a variation in the thickness of the walls. That is a point the manufacturer is trying to solve, but we do the very best we can to keep that core from sagging. It is the tendency of the sand to float on account of the metal being heavier than the sand. That is especially so on the 2 inch pipe because it has less sand to keep it anchored on. The manufacturers do the best they can because they don't want to send out pipe thicker on one side than the other. If they do they run considerable risk of loss.

Mr. Ochampaugh, Edmonton: I would like to ask if it would be any hardship on the manufacturer if we would adopt a 2 inch, 3 inch and 4 inch pipe and say two or three fittings.

Mr. Nixon, Saskatoon: Is there no chance of reinforcing the core to keep it from floating?

Mr. Mathias, Regina: Is it not possible that the pipe could be cast in an upright position rather than horizontal? Where that is adopted you will get a reasonable thickness.

Mr. Wharton, Winnipeg: Speaking on this point I would rather cut 3 pieces of 4 inch pipe than one piece of 2 inch pipe. To make a piece of soil pipe fit wouldn't be such a bad job if it wasn't so hard. We will say, for instance, that you commence to cut a 2 inch pipe. One side is $\frac{1}{4}$ inch and the other is 1-16 inch. You can't touch the light side and consequently off it goes. Is there no way to keep that thin portion as soft as the thick portion. Then again in connection with our bends we figure on increasing the length of the spigot end of the bend. The bends we are using today are not perfectly round and where they are not round the wide portion seems to come where we can't get at them. You take for instance a $\frac{1}{4}$ bend and you put it in the hub, the very point where it is difficult to caulk you can't get any oakum in.

Mr. Anthes, Winnipeg: In answer to the former speaker regarding a soil pipe being thick on one side, no manufacturer could guarantee that it could be cut off by a hammer and a chisel. Every manufacturer tries to get it soft enough to get it cut that way. When you get a very close grain your iron has got to be a little harder than when you don't. The necessity of keeping your iron with as close a grain as possible to prevent it being porous prevents the possibility of it being cut easy. I may explain why the thin side is harder than the thicker side. On the thin side you get what is best for non-porous pipe and on the thick side you get what is best to cut. Without throwing any bouquets at myself I have had American manufacturers ask me how we get 2 inch pipe straight. I think in the last year we have obtained better results on 2 inch pipe thickness. Get your core perfectly anchored and you will overcome this somewhat. One gentleman suggested that the pipe be cast on end. That was a method that was in vogue some years ago, but now it is cast on its side to get the quantity turned out to supply the market. If the pipe was cast vertically there would be a great shortage, as we couldn't produce as much pipe per man. Unless you get your soil pipe on a job everything on the job is held back. There were a lot of manufacturers in Eastern Canada last year who came to us and raised "Old Ned" because they couldn't sell their brass goods. I might say we equipped a plant for medium and extra heavy soil pipe at Winnipeg and it will be less hardship on us, but it is up to the Sanitary Engineers; they are here to get the best sanitary results. No manufacturer should dictate on that matter. The manufacturer could help on a great many points. I might explain in regard to these fittings with long spigot ends, that it makes it harder to maintain the same thickness, however, I think that is a thing that can be discussed and a satisfactory compromise arrived at. Speaking for ourselves, we will only have to carry one line, but if some of the manufacturers from the East were here they might put up some very strenuous objections. It might be well to get opinions from the Eastern manufacturers.

Chairman: I am sure that we have all listened with interest to Mr. Anthes' explanation of the difficulty of establishing a foundry in Western Canada. I think Mr. Ochampaugh asked him if there would be any hardship.

Mr. Anthes, Winnipeg: I don't think there would be any hardship. It will only be a matter of making new patterns. I will say for the

Eastern manufacturers, it will be necessary for them to increase their outside wall thickness. You see it is to the advantage of the manufacturer to get the outside walls lessened to the smallest diameter possible, because he can make his pipes so much thicker. Personally I would like to see the outside walls made $\frac{3}{4}$ of an inch thick and our losses in production would not be nearly so heavy.

Mr. Ochampaugh, Edmonton: I believe so long as this institute must make a standard for pipes and fittings we should get busy as it is getting rather late. I believe we should standardize pipe and four fittings. This wouldn't be too great a hardship on the manufacturer and it would be a great benefit to the West. When Mr. Anthes says certain things would be of greater advantage to him and that he is willing to co-operate with this convention, I believe he is to be commended. (Applause).

Mr. Lamson, Winnipeg: Have the various representatives the power to accept a standard for their particular locality and if adopted by this Association would the By-laws have to be readjusted in their particular locality? The question is this: In the standardization of soil pipe and four fittings. If that fitting should come into a locality would it be in order?

Mr. Huntbach, Edmonton, (Acting Chairman): If the soil pipe and fittings do not conflict with the present By-laws it would not be out of order.

Mr. Ochampaugh, Edmonton: I would like to see a committee of three appointed to confer with Mr. Anthes and report back to this Institute this evening.

Mr. Huntbach: Motion carried.

Chairman (President in Chair): I was asked to name a committee of five on the question of "Soil, waste and vent pipes." That committee will be Mr. Huntbach, Mr. Milligan, Mr. Knechtel, Mr. Fletcher and Mr. McFarlane. The committee of three to confer with Mr. Anthes will be Mr. Nixon, Mr. Adams and Mr. Ochampaugh.

The next business on the programme is a very important matter. It has been suggested that we take up a night session, partly for business and partly for pleasure. Make it a combination smoker with a little business. In the latter part, of the evening the Edmonton Master Plumbers have a programme they will put on. "Adopted." As the hour is rather late I think this would be a good time to proceed with the election of officers and get that over tonight. We have a number of applications for membership and we would like to put them through. I will read the names out. They have all been favorably passed on by the directors.

Ferguson G. Smith, Plumbing Inspector, Edmonton, Alta.

James Adams, Master Plumber, Regina, Sask.

P. D. Henderson, Journeyman Plumber, Saskatoon, Sask.

John Stevenson, Journeyman Plumber, Saskatoon, Sask.

Horace C. Nixon, Journeyman Plumber, Saskatoon, Sask.

M. G. McGrath, Factory Inspector of Saskatchewan, Regina, Sask.

Neil Beaton, Master Plumber, Saskatoon, Sask.

John D. McGrath, Journeyman Plumber, Saskatoon, Sask.

Mr. Bulloch: May I have an application blank?

Chairman: They are on the table. I would suggest that the members take one or two around with them.

Mr. Mathias, Regina: I would suggest that as the place at which the next convention is to be held might have some bearing on the election of

officers, I would be in favor of settling the place of meeting first.

Chairman: Mr. Mathias has suggested that the place of the next meeting be taken up first. What is your pleasure with regard to the applications?

Mr. Ochampaugh, Edmonton: I move that they be accepted.

Mr. Nash, Edmonton: I second it, provided the proper money is in the hands of the Secretary.

Chairman: Carried.

Mr. Mathias, Regina: I have on behalf of the Regina representatives to ask that the next Convention be held in Regina. I am not going to say very much about it. We have in Regina the Capital of Saskatchewan. I have no doubt but that Regina is pretty well known to the gentlemen who are attending this convention and without laboring the point I would ask that the next convention be held there. I can only promise that those interested in the convention will do all in their power to make the convention a success and we have the full sanction of the Council of Regina. The Mayor says, "Please extend on my behalf our cordial invitation to hold their next annual convention in Regina."

Mr. Robertson, Regina: I take pleasure in seconding that motion.

Mr. Adams, Regina: We, the Master Plumbers of Regina, had a special meeting a few days ago and if it comes to Regina we are going to do the best we can to entertain you all.

Mr. Knechtel, Saskatoon: I think it requires very little persuasion to convince you that we have a right to ask you that the next convention be held in Saskatoon. I would not for a moment attempt to belittle Regina's efforts; I rather admire them for their spunk in making this motion. I think these two members have a great deal of credit coming to them for putting out a project of this kind, but I think it is quite proper that Saskatoon from every point of view is the better place. We have no telegram from our Mayor, but that was taken for granted before we left. The Council was very much in favor of having representatives sent to this convention and we came very near having one of the Commissioners come. In addition to that we have a strong representation from our local union, which is a large body. We also have our public school director here. I don't think it is through any lack of publicity in the City of Saskatoon that we have got to the stage where we are. I think I can extend to you the hearty invitation to hold the next convention in the City of Saskatoon. The builders' association, which met in Edmonton, decided to hold their next convention in Saskatoon. While we have the convention spirit and we have to set table for the other convention it will be very little trouble to handle this one. Therefore, on behalf of Saskatoon I make a motion that the next convention be held there.

Mr. McFarlane: I have just received a telegram from local No. 264 Plumbers and Steamfitters, which reads as follows:—"Local No. 264 Plumbers and Steamfitters, Saskatoon, present their compliments and extend to you a hearty invitation to hold the convention in the wonder city next year."

(Signed) Malcolm Nicholson,
Recording Secretary.

Applause.

Mr. Robertson, Regina: I think we all appreciate the efforts that Saskatoon has taken, but I think you ought to send the convention to Regina to liven up the members. Saskatoon is lively enough.

Mr. Taylor, Saskatoon: I don't think it is advisable to send a con-

vention to a dead town. (Laughter.) There isn't much left for me to say in regard to having the convention held in Saskatoon next year. We have taken a great interest in this Institute all through and you can realize by what has been done that we have. At our last convention you will remember we ran a pretty hard race to get this convention held there. For the members of Saskatoon I want to say, you will find the right spirit there. It will enliven the City Council and it will help us considerably.

Mr. Bowcott, Edmonton: I would take pleasure in seconding that motion. I believe in honor where honor is due. It is all very well to say to send the convention to Regina to liven them up. I don't think so. It is only the second convention and I think the representation from Saskatoon has put other than words into this convention and I have great pleasure in seconding that motion.

Mr. Robertson, Regina: That is their idea in bringing the bunch here.

Mr. Taylor, Saskatoon: It is only for the purpose of education that we are here.

Mr. Nixon, Saskatoon: I would call your attention to the interest the City Council are taking in this convention. They are paying the expenses of one journeyman plumber to this convention. Further than that, on Thursday evening last I met Mr. Yorath, City Commissioner, and he expressed his regret at not being able to come to the convention. We want it by all means.

Chairman: You have two propositions before you, it is a question of Regina or Saskatoon.

Mr. Mathias, Regina: Had I known Saskatoon was going to make a try, I had no indication of it at all, I think we two should have been one on that question.

Chairman: We will take ballots.

We will now have the scrutineers report of vote on place of Convention.

Mr. Fletcher, Calgary: Your committee beg to report as follows:—The total number of votes cast, 36; Saskatoon 26, and Regina 10.

Chairman: It is with pleasure that I announce that our next convention will be held in Saskatoon on the first Monday of May, 1915.

Mr. McFarlane: I have a telegram from W. G. Jones. It reads as follows:—"I regret that I am unable to be present on behalf of Moose Jaw" Yours very truly. (Sgd.) W. G. Jones, Plumbing Inspector.

The election of officers for the following year was proceeded with and the following gentlemen were elected:

President—

Jas. Smith, Winnipeg.

Vice-Presidents—

J. R. Huntbach, Edmonton.

R. J. Swain, St. Boniface.

S. MacNamara, Fort William.

J. G. Morgan, Vancouver.

Secretary-Treasurer—

Wm. McFarlane, Winnipeg.

Board of Directors—

H. D. Mathias, Regina.

Neil Beaton, Saskatoon.

A. L. Milligan, Calgary.

Publication Committee—

H. C. Nixon, Saskatoon.

Harry Nash, Edmonton.

Jas. Adams, Regina.

Committee on Research—

H. D. Mathias, Regina, (Chairman).

Jas. Adams, Regina.

E. P. Fletcher, Calgary.

J. T. J. Vallance, Lethbridge.

Wm. Fairley, St. Boniface.

J. McNeill, Winnipeg.

H. C. Nixon, Saskatoon.

Chairman: The motion to adjourn is now in order, we will meet at 8 o'clock sharp.

May 5th, 1914, 8.30 p.m.

Chairman: I appointed a research committee at last convention. The research committee in work of this kind is a very important one. Mr. Mathias has had some difficulty in keeping in touch with the members of the committee. I am going to call on him to give his report.

Mr. Mathias, Regina: I am afraid this report doesn't reach a very high standard of perfection but such as it is I will present it to you. It is quite true we have not been able to get into touch with the members of the Research Committee, that may be due in some measure to my being new to this work and I may say that I have communicated twice with the members of the Research Committee, two of the gentlemen have been very good in formulating reports. I must warn you not to expect anything very great, the art of research being an old institution. However this may contain suggestions of some small interest which may not have been anticipated up to the present time. Some parts of it in regard to the terminals has already been thrashed out during the day. To the President and Council.

Gentlemen:

It has been the wish of the President of the Institute, communicated to the Chairman of the Research Committee, that there should be a report submitted which would reflect credit upon its members, I now have pleasure in laying before you a brief record of what has been accomplished.

The committee consists of six members and the chairman, the letters of inquiry and suggestion have been sent to all on two occasions. As a result I have received replies from Messrs. McNeill, Fairley and Good. The letters are appended to this and may be read in full if desired, yet it may be well to summarize their purport if only to show what is to follow.

Mr. Good states that in his opinion the materials which are used in the work of the plumber last quite long enough, but he suggested that "a great improvement would be made if a closet to hang on the wall and a tank and seat of non-absorbent material were in general use."

Mr. McNeill makes a valuable contribution, with photographic illustrations, in which he deals with traps having internal partitions, and proves their unreliability together with the false sense of security which they give. Mr. McNeill advocates the abolition of this trap in any form of metal, and that when used as part of a water closet basin it should be subject to strict test. He is also desirous of those engaged in plumbing being subject to examination, and that those who are not competent should be prohibited from carrying out work. The smoke test prior to the habitation of a dwelling is advocated, and it is also suggested that the Inspector should be permitted to destroy materials which are condemnable on account of defects.

Mr. Fairley deals with the appointment to the office of Plumbing Inspector, of men who have had neither experience or training. He also

writes of the satisfactory progress made in the design of Sanitary Fixtures, which in his opinion now require a minimum of attention and approach the acme of cleanliness. Mr. Fairley believes in the abolition of the overflow and gives his reasons. Perhaps the most interesting part of this letter is that dealing with the closure of soil pipe terminals, and probably the conclusion drawn will meet with general approval.

Other matters referred to will be brought up before the convention under other business.

It occurs to the Chairman in making this report that the Constitution of this committee is questionable, and that a result more nearly approaching research might be obtained if the members had been chosen from one City. As it is, there is nothing more tangible than can be conveyed by suggestion, as a conclusion I beg to append a few remarks of my own, with the wish that the year to come may produce something more in accord with its title.

RESEARCH COMMITTEE

One of the most interesting discussions which occurred at the Winnipeg Convention was that relating to the closure of Vent Terminals during continued severe weather, and that question has no doubt received a great amount of consideration from those who heard the discussion, as well as further thought from those who took part in it. Without going into statistics which at best might be unreliable, for it is possible to seem to prove just what one wishes: I would say that the conclusions are in favor of the shortened terminal, though the figures if quoted could hardly be relied upon to prove the case. Some terminals close to the roof have been found stopped, while others of three feet in length have been found clear. Such examples are in the minority. The determining circumstances as to whether stoppage takes place vary, and this will depend upon such influences as the diameter of the pipe, whether it has been increased merely at the roof level or some distance below, the position of the terminal as regards the sun's rays, whether the approaching pipe is carried through a heated room and also upon the quantity of hot water discharged into the system it serves. It may be a moot point yet whether the shortening will successfully avoid a frost cap during the longest periods, and the writer suggests the advisability of the insertion of a Y fitting in such a position that it may be used for access to the head of the stack, so that the frost cap may be dislodged either by a rod or by the injection of steam. Perhaps a little speculation as to how the occurrence takes place may be opportune. It is suggested that the cap in question is not a block of ice but frozen vapor, in particles, which would require the expenditure of fewer heat units than if frozen water. Ascending vapor on coming into contact with the colder iron is condensed, and if the temperature of the metal is lower than freezing point the resulting particles of water are solidified, at first in the periphery of the increaser afterwards taking the form of an irregular cone, somewhat hollow, its shape being governed by air currents.

Another point which might well receive discussion arising out of experience during the past twelve months, is the use, the form, and the size of grease traps. A grease trap which does the work expected is an aid to sanitation, but on the contrary it may be an abomination. It

is a question whether the form of grease trap in general use is large enough, even when water cooled. A rule given by a writer on plumbing matters is that the container should have twice the quantity of water in it that is likely to be discharged at one time. This at best is doubtful in result as it is obvious that the effect must depend upon the temperature of the water and the normal temperature of the air surrounding the trap. Without laboring the question at this stage it is suggested that grease traps do not prevent the ultimate stoppage of a drain as well as expected, and that where it is practicable to reach the likely point of stoppage through cleanouts, there are cases in which grease traps may be dispensed with.

The constant system of water supply is a boon which cannot be too highly appreciated or extolled, yet there are times when the service is shut off, and it may not be out of place to draw the attention of this convention to the fact that under certain circumstances communication may be established between the water mains and the sewers. One might ask if provision should be made to keep the necessary excavations apart. The practice of allowing the overflow from water closet tanks to communicate with the flush pipe is a questionable one.

Arising from the perusal of contemporary literature the writer would direct the attention of members of the Institute to the paper read in Winnipeg to the Sanitary Engineers Association, prepared by our President and more especially to the succinct manner in which the most recent knowledge as to the effect of sewer gases upon the health of the people is treated. This is a subject with which every inspector should be familiar in the latest phase.

Now, Mr. Chairman, I have given a resume of what it contains.

Chairman: The chairman of the Research Committee desires that the letters from the members of the Research Committee be read.

Mr. Beaton, Saskatoon: I believe the object of this meeting is solely one to gather knowledge. Now, if these letters are liable to impart knowledge I would be in favor of having them read.

Chairman: Will you make a motion to that effect?

Mr. Beaton: Yes.

Chairman: Motion carried.

Mr. Mathias reads letters from Mr. McNeill, Winnipeg, and Mr. Fairley, of St. Boniface.

Mr. McNeill's Letter

Mr. H. D. Mathias,

Chairman of Research Committee,

Canadian Institute of Sanitary Engineers,
Regina, Sask.

Dear Sir:—

Herewith I submit the following report with photos and sketch enclosed which will impress more fully these remarks. This subject may be of little interest to some, but when a By-Law governing modern and sanitary plumbing is being considered it is very important. It has proved interesting to have the experience of locating defects in plumbing installations.



Section of clean sweep trap after being cut in two, showing hole in the interior partition, $\frac{1}{4}$ inch by $1\frac{1}{4}$ inch above the seal and opposite the outlet through which the drain or sewer air has a free and unrestricted access into the house, even though the supposed trap contains a body of water which forms the seal, the defect being above it.



Globe trap and what was discovered when smoke test was applied, this trap was installed upside down and the outlet used for inlet, the interior casing or ball that contained the seal was corroded away from the arms that hold it in suspension. Later this part was removed probably because of its obstructing and retarding the flow of waste water from the fixture. It will be seen that the important part of the trap had been destroyed, rendering the trap useless and making it a dangerous nuisance, fit only for the scrap heap. There is another point worthy of notice, i.e. the manner of in-

stallation whether it was a mistake or ignorance on the part of the person who installed it not understanding its construction. This

demonstrated the necessity of a By-Law governing traps. If ignorance it confirms the contention that all who engage in the plumbing business either as an employer or as an employee should prove their ability by examination in theory and practice.



Trap of similar type with all its parts. On examining this trap it will be seen how easily it is for an unskilled party to reverse it and while it is intact still have a seal. But such a trap possesses the features that condemn it, namely: Has dip pipe; depends on concealed partition for retaining the seal; has a part that can be removed, and its large fouling surface and construction that retards the flow of waste water.



14 syphon jet W.C. bowls taken out of an apartment building. These bowls were defective in the traps, the defects showing when the smoke test was applied. The remarks and photos will be proof and ground for the following resolutions which, personally, as a member, I desire to voice, and trust they may be considered:

1st. The prohibition of all traps having interior or concealed partitions, dip pipe, movable parts which may become defective as shown in photos 1 and 2. Makers admit there is a possibility of a chance of defects in brass and lead traps, especially in those containing the concealed partitions, and it is for all concerned to raise a strong objection and guard against any possibility in this respect to protect the welfare of those who have placed us in this position. Except earthenware

fixtures, because these, if right at first do not corrode or develop such defects as is found in brass or lead, on account of the material they are made of and the enamel coating, and there is no reason why they cannot be tested before leaving the factory under guarantee.

2nd. The examination of those engaged in the trade and the prohibiting of men who do not know the proper way to install a trap, not speaking of Plumbing in its varied aspects.

3rd. The necessity of a smoke test as a final inspection before a certificate of occupancy is granted.

These defective traps and bowls were discovered by such a test. Had there been no such test these defects would not have been detected. I personally have seen over twenty defective closet bowls this season. From my experience since the smoke test was made compulsory in Winnipeg, it has been proven that this test is the most important and is as much required as the water test on the roughing in. It seems strange to be indifferent in this respect and more so when such defects are liable to be in traps and fixtures, not speaking of other defects such as nail holes, defective floor and wall connections of W. C.'s, broken pipes in ditches which could not and would not be detected unless by a smoke test. I am aware the public object on account of expense, but it only takes an occurrence such as photo 4 describes to disabuse their minds. There is one marked improvement this test has brought about, that is it has raised the standard of plumbing and made the plumber more careful in installing and protecting it while under construction. There is also the satisfaction to the owner, the contracting firm and the Plumbing Inspector that after such a test has been applied it is air tight.

4th. Permission to destroy or mark in such a manner defective W. C. bowls before returning so that they cannot be shipped to other places.

There is a section (No. 35) in the Winnipeg Building By-Law which has proven very satisfactory and reads as follows:—"Where it is desired to occupy a building for which a permit to build has been issued, the architect or owner shall make declaration in writing to the Inspector of Buildings that the building has been erected according to the By-Laws of the City of Winnipeg, whereupon the Inspector of Buildings may within three days issue a certificate of occupancy. No such permit shall be given until the plumbing and drainage system of such building has been inspected and tested as defined in the plumbing By-Law of the City and found to be in accordance with such By-Law, and a certificate given to that effect."

Respectfully submitted,
(Sgd.) J. McNeill,
Assistant Plumbing Inspector

MR. FAIRLEY'S LETTER.

Mr. H. D. Mathias,
Regina, Sask.

Dear Sir:—

Your welcome communication of March 30th received. I must apologise for not having communicated with you before this time, and must plead pressure of other business as my excuse.

Now, Mr. Chairman, as I have never had any previous experience in connection with research committees, I am almost at a loss as to how to begin, however a short review of our profession in general will I hope, be in keeping with my duties as a member of your research committee.

First of all, I would like to say that it is with some feelings of regret that I view the increasing tendency on the part of representatives of the people in growing towns and Municipalities to appoint as Inspectors of Plumbing, men who have neither a technical nor a practical knowledge of anything that pertains to sanitary engineering, the excuse for their pernicious system being economy? The so called Plumbing Inspector having a combination of other duties to perform, I submit to you, Mr. Chairman, that proceedings such as these endanger human life to some extent, besides being a betrayal of trust to the people on the part of their representatives and an insult to the profession of Sanitary Engineering.

I sincerely trust that the C.I.S.E. will take this matter up in the near future and secure government intervention in such cases if no other way can be found.

Apart from the evil I have just put before you, and reviewing the profession generally I think we have reason to congratulate ourselves on the progress which is being made in the field of Sanitation. Manufacturers are vying with each other in producing sanitary fixtures which with a minimum of attention on the part of the users, are the acme of cleanliness. Laws, for the proper installation of plumbing are becoming more strict, and are also being more rigidly enforced, and in this connection this new country of ours is benefiting in avoiding the mistakes made by sanitarians in the older countries; and although plumbing is still somewhat of an enigma to some people, the majority are taking an intelligent interest and demanding that the best plumbing be installed in their homes.

Reverting to the subject of Sanitary fixtures, an article which appeared in one of our trade papers not long ago comes to my mind. The article was entitled "The Elimination of the Overflow". To my mind, Mr. Chairman, overflows in fixtures are at the present day unnecessary for the following reasons. (1) The majority of people have become so accustomed to the use of plumbing fixtures and know how to use them. (2) Overflows are insanitary inasmuch as their mode of construction prevents them being kept in a cleanly condition. (3) The vast majority of overflows do not fulfil the purpose for which they are installed.

And after all it is only by experience that we learn, and it is safe to say that if a person through carelessness allows a fixture to run over on the floor once, he or she is not likely to repeat the experience.

Reverting to some of the subjects which were remitted to the research committee for consideration, during the winter much of my spare time was spent in investigating and experimenting as to the best method of protecting pipe terminals on roofs from frost closure. I may say that in Manitoba this trouble of frost closure is very real, and

considerably impairs the efficiency of all plumbing installation during the extreme cold weather. During the month of February of this year conditions were very favorable for experiment as we had then fourteen consecutive days with a temperature averaging between 30 and 40 degrees below zero. The results from experiments show as follows:—

1st. That it is necessary that where terminals are 4 inches or less in diameter that they shall be increased 2 inches in diameter before passing through the roof.

2nd. That the terminals shall not project through a pitched roof more than one inch on the high side.

3rd. That terminals shall be carried up to the peak or highest point on a roof.

4th. That terminals may be made weather tight by means of a lead flashing caulked into hub with iron ring.

This method had a thorough test during the winter in Winnipeg and St. Boniface and the results showed a satisfactory solution of the difficulty.

The following subjects, Vis:—"The Examination of Plumbers," "Standardization of material," and "sizes of soil, waste and vent pipes." These subjects are still under the consideration of our local committee here and I will but briefly touch upon them at this time.

I think all who have the best interests of sanitation at heart agree that examination of Plumbers is necessary, chiefly because of the close relationship of Plumbing to public health, and plumbing work cannot be satisfactorily executed except by those who are experts in the craft; but there seems to be a legal difficulty in connection with examination of plumbers, and in the light of recent legal decisions it appears that while it would be within the law to compel plumbers to stand examination it would be unlawful to prevent a man working at his trade if he failed to pass in his examination. On the other hand the very fact of knowing that they would have to stand examination, would deter inefficient men from trying to work at plumbing where such a law was in force.

Regarding standardization of materials. This is one of the very important matters which will come up for discussion at the convention.

A very complete record and sketches of improved iron pipe and fittings have been drawn up by our local committee and will be submitted to the convention for consideration.

Several points we have agreed on, are, the fittings should be at least 4 inches longer on the spigot end than they are at the present time, that the walls of pipes and hubs should be a certain stated thickness, that bends should have a larger radius, that the weights of all sizes of pipes above 4 inches in diameter should be extra heavy. That manufacturers names or other raised letters should not be cast on the outside walls of the pipe but should be placed on the hub of the pipes.

Sizes of Soil, Waste and Vent pipes. This subject has always created considerable differences of opinion, and as it would take some considerable time and space to discuss the question fully I will content myself, Mr. Chairman, with referring you to the clause in the Plumbing code of the City of Calgary, governing that subject, which clause in my opinion covers this question more fully than any other rules to be found in other codes.

In the few weeks that are left before convention, if time permits, I should like very much to add a little more to this somewhat incomplete report.

At time of writing, I do not know whether I will have the pleasure

of meeting you at Edmonton as our City Council have not yet arrived at any decision in the matter. In any event, that the convention will be an unqualified success is the earnest hope of,

Yours faithfully,

(Egs.) W. Fairley.

St. Boniface.

Applause.

Mr. Mathias, Regina: I think the rest of the letters relate to the blue prints on the wall and your report. There is another point to which the attention of the convention might be called, that is whether we should not take some thought as to what happens after the work is finished, and whether there ought not to be on the part of the inspector a thorough inspection with a view of taking some steps to see that plumbing remains in good condition and see that it is looked after. No modern idea is so much in demand as the prevention of sewer gas entering buildings. It may be the means of introducing the germs of infectious disease. It frequently is pointed out that it reduces the amount of oxygen and brings about a tendency to cause germs to form. I hope that we have at least introduced a little that may be productive of some further thought on your part.

Applause.

Mr. Fletcher, Calgary: I move that this convention go on record as extending a vote of thanks to this committee and particularly to the chairman as to the way they have conducted work during their term of office.

Chairman: There is a motion before us moved by Mr. Fletcher and seconded by Mr. Swain that the heartiest thanks of this Institute be tendered to the committee on research for their very arduous work during the winter and splendid reports they have brought in tonight. All in favor. (Loud applause).

Chairman: Before leaving this business, gentlemen, I think in view of the large number of very good suggestions that are incorporated in this report that it will be the duty of the executive committee to hand it over to the publication committee to have it published in the journals.

We will now go on to the next business of the meeting, that is the report of the committee on "Pipes and Fittings" that we appointed to confer with Mr. Anthes.

Mr. Nixon, Saskatoon: These are the conclusions of the committee that conferred with Mr. Anthes. Mr. Anthes has a sample which most of you have seen showing the 2 inch member on the old style "T.Y." fitting inclined. Mr. Anthes thinks that it could be inclined slightly more, so that it will be considerably less than a right angle. It is an advantage for that 2 inch branch to be inclined to the 4 inch. Mr. Anthes tells us that he is already making cellar traps with a 4 inch seal. There is a call for traps with a much greater seal than that in vogue. One of the Saskatoon committee thought that if a bleeder or by-pass was fixed on the flush pipe of the nearest closet and discharged over the cellar trap or into the catch basin, that it would keep it charged. It would result in the seal being recharged and it would also change the water frequently. That is to say that within a space of 24 hours in an ordinary house the water would be entirely changed; the seal would be so often replaced by clean water and would not give off f. odours. The 4 inch seal can be had at the present time. We are all agreed however that cellar traps should have longer spigot ends to insure better joints. It was the opinion that hubs are quite deep enough but

the trouble is we cannot get at them and therefore we recommend that the hubs should not be deeper nor shallower than $2\frac{1}{2}$ ". Otherwise we would recommend that all hubs and pipes should conform to the schedule which is pinned on the wall and submitted by the Winnipeg Committee.

Mr. Anthes suggests that these pipes and fittings should be given a name to distinguish them from the present pipes and fittings in vogue. I might tell you that Mr. Anthes said that if the committee passed this, he will get out full size drawings and get blue prints made and submit them to the officers. If the officers approve them he will send them to the Eastern Manufacturers. That is the report of the committee. Applause.

Mr. McFarlane: I wish some information. You say the hubs should be not less or more than $2\frac{1}{2}$ ". Would you make them all the same depth?

Mr. Nixen, Saskatoon: No, the one we selected was 4 inch pipe, just for an analogy. We say the hub is sufficiently deep, otherwise the hubs of other pipes shall be relatively shallower or deeper in proportion to the Winnipeg schedule.

Mr. Taylor, Saskatoon: I move that we take these clauses up and pass upon them individually.

Mr. Huntbach, Edmonton: I second the motion.

Motion carried.

Mr. Nixon, Saskatoon: The first one is the vent terminals for the various roofs. The vent terminals for flat roofs shall consist of the ordinary short increaser and that two special 4 inch to 6 inch increasers be made with sloping tops. One at an angle of 30 degrees and one at 45 degrees.

Mr. Bowcott, Edmonton: I move that this section be adopted.

Mr. McGrath, Saskatoon: I second it.

Mr. Huntbach, Edmonton: Is it intended that the ring which is spoken of will come along with that fitting.

Chairman: Yes, that is the intention.

Mr. Taylor, Saskatoon: Are those two fittings supposed to cover every pitch of roof?

Chairman: The committee think so.

Motion carried.

Mr. Nixon, Saskatoon: The second section is the Sanitary 4x4x12 T.Y. be made with the 4 inch branch raised higher on the side of the stalk. This is Mr. Anthes suggestion that they raise the branch up until it touches the hub. The branch will be longer with an easier sweep to it. His reason for raising it is to keep the fitting from being too long. The 2 inch side inlet to be at an angle of 15 degrees to the horizontal. This 2 inch inlet would be 4 inches long with a standard 2 inch hub and the main stalk to have a 5 inch straight spigot end. Gentlemen, this is the fitting as made by Mr. Anthes at the present time. You will see that it has't a very big sweep on it. He thought to put a sweep on it would make it too long. He suggested raising it so that it will be kept within as short a length as possible. This 2 inch branch is at an angle of 15 degrees to the horizontal. He will lower it slightly so there will be plenty of strength for caulking.

Mr. Huntbach, Edmonton: I would like to know if there was any point determined on as to the angle of the two branches of the main stack, the angle of incidence between the two branches.

Mr. Nixon, Saskatoon: Mr. Anthes could not tell that, but he hopes to be able to get this angle down to 60 degrees. He will get it down to 75 degrees anyway.

Mr. Huntbach, Edmonton: I would like to see it at 45 degrees.

Mr. Vallance, Lethbridge: Will the hub on the 2 inch eliminate the inside shoulder?

Mr. Nixon, Saskatoon: Yes, the shoulder will be on the hub. On the Y. fitting there will be a straight spigot end not less than 5 inches long. Mr. Anthes wished to put it in that form. He said personally he would do his best to make it 6 inches long.

Mr. Huntbach, Edmonton: I move the adoption of that report.

Chairman: Agreed unanimously.

Mr. Nixon, Saskatoon: The third section is, all Y. fittings to have a straight spigot end 5 inches long.

Chairman: Agreed unanimously.

Mr. Nixon: Section four is next. All bends shall have straight spigot ends not less than 5 inches long.

Chairman: Agreed unanimously.

Mr. Nixon: The depth of the 4 inch hubs should be practically left as at present, the others to be relatively shallower or deeper in proportion to the Winnipeg schedule. Weights and dimensions of fittings, also diameter of pipe and hub to conform to the schedule of the Winnipeg committee.

Agreed.

Mr. Nixon: Now as to the cellar traps. We are divided about these, as to the 4 inch or 1½ inch seal. I might point out to you if we have a 1½ inch seal it will be necessary to have a recharge.

Mr. Wharton, Winnipeg: I would suggest that those used on rain water leaders and catch basins should have a 4 inch seal.

Chairman: I believe that was passed upon at the last convention. I am sure that it was. If that was so we are taking up time unnecessarily.

Mr. Nixon, Saskatoon: The next thing in regard to the standardization of fittings will be the name by which they are to be called to distinguish them from the other forms.

Mr. Ochampaugh, Edmonton: There was one thing we talked about which we failed to incorporate, that is what is called the St. Boniface fitting. That is being made at the present time. We thought we would adopt that.

Mr. Knechtel, Saskatoon: — I move that it be adopted.

Chairman: Agreed. We are open for suggestions for a name to be applied to the new pipe and fittings.

Mr. McGrath, Saskatoon: I would suggest in courtesy to the City of Edmonton, that we call them the Edmonton fittings. We considered the word "Arctic" being so near to the arctic zone.

Mr. Knechtel, Saskatoon: I would suggest the word "Acme".

Voice: I would suggest the word "San".

Mr. Huntbach, Edmonton: I would suggest "Edm", an abbreviation for Edmonton.

Chairman: The names suggested gentlemen, are Arctic, Edm, San and Acme.

Mr. McFarlane, Winnipeg: I move, gentlemen, that we take the letters of our Association C.I.S.E.

Mr. Mathias, Regina: I suggest that this be taken the first thing tomorrow morning and that we adjourn.

Chairman: We will adjourn till tomorrow morning at 10 o'clock.

May 6th, 1914, 10 o'clock, a.m.

Chairman: While waiting for the report of the committee on "Sizes of Soil, Waste and Vent pipes" we will proceed with the subject of "Rain Water Leaders".

Mr. Nixon, Saskatoon: Acting Secretary. Reads recommendations of the various committees.

Winnipeg recommendation. No rain water leader shall be used as soil, waste or vent pipe, nor shall any soil, waste or vent pipe be used as a rain water leader. Every rain water leader inside any premises shall be constructed of cast iron, galvanized wrought iron or steel pipe with roof connection made gas tight by means of heavy lead or copper drawn tubing, wiped or soldered to a brass ferrule or nipple caulked or screwed into a pipe. Every rain water leader shall be trapped before being connected with the house drain.

Edmonton recommendation. Rain water traps shall be placed inside the building and beneath the basement floor, same shall be provided with a cleanout on the house side of the trap which shall be extended so as to be level with the basement floor.

Rain water leaders and cellar drainage traps shall be of iron, not less in diameter than 4 inches and shall have a water seal of at least 4 inches.

Saskatoon recommendation. That rain water leaders shall be always disconnected from sewers and plumbing fixtures and not used as vents. That is to say — that where there is no separate storm water sewer, they shall be trapped before they enter the house drain. No vents from plumbing fixtures shall be connected to any rain water leader.

Where vents are carried into rain water leaders storm water may flood the plumbing fixtures in case of a chokeage of the rain water drain or trap.

Mr. Bulloch, Edmonton: I would suggest that we adopt the method used in Edmonton of trapping rain water leaders by means of a sand trap, it might be as well to illustrate the points on the blackboard. (Sketches on blackboard.)

Chairman: I think so far as Mr. Bulloch's resolutions in connection with the traps are concerned we have already passed on that. We have decided to use traps with a 4 inch seal on all rain water leaders and catch basins.

Mr. Swain, St. Boniface: Is that trap going to have a cleanout on it?
Chairman: Yes, any discussion?

Mr. Wharton, Winnipeg: I was under the impression last night that we were to have a cast iron trap with a 4 inch seal.

Chairman: That is what I have already stated.

Mr. McGrath, Saskatoon: It might be a good move to put in a clause to allow the use of an improved sand trap. Some architects specify that a sand trap shall be used to keep gravel from getting into the sewers. I think a clause could be added such as "An improved style of sand trap".

Chairman: We are considering the whole matter of rain water leaders. If somebody is ready I would like to have the essential points approved. We will adopt the usual manner of appointing a small committee.

Mr. Adams, Regina: Would it be necessary to specify anything like that? It would have to be on line with the trap anyway, and if it had a 4 inch seal it would be alright.

Chairman: That is absolutely right.

Mr. Adams, Regina: The sand trap is just a modification of the catch basin.

Mr. Campbell, Medicine Hat: In cases where it is found necessary to run into a storm sewer rather than a domestic sewer, you wouldn't have to trap it.

Chairman: Yes, that is so. I haven't laid down any rules as far as the construction or anything else is concerned. We want the essential points stated, and then we can take it up with the committee.

Mr. Campbell, Medicine Hat: Down in Saskatoon the inspector says that domestic sewers are not large enough to handle the flow of rain water.

Mr. Vallance, Lethbridge: If you are going to allow an improved sand trap, would it not be well to have something in the By-Law specifying what an improved sandtrap is.

Chairman: You couldn't standardize that. Will some one make a motion combining the essential points.

Mr. Taylor, Saskatoon: There seems to be no doubt about the argument taken up against this clause of using these traps for anything else but for rain water leaders and I would recommend the adoption of the clause recommended by Winnipeg committee.

Chairman: Any seconder to Mr. Taylor's motion to adopt this clause.

Mr. Ochampaugh, Edmonton: I would like to see it specified that copper tubing be not used on galvanized roofs.

Chairman: Have you any objection to that being incorporated in your motion?

Mr. Taylor, Saskatoon: No, I don't think so. If you are going to get a number of these devices mixed up, you are going to have a terrible mix up.

Mr. Ochampaugh, Edmonton: If you put copper there you will have a ground for electricity.

Chairman: You have an objection to copper.

Mr. Wharton, Winnipeg: I second the motion.

Mr. Nixon, Saskatoon: Before the question is closed I wish you would read the clause over again.

Mr. Mathias, Regina: It seems to me by what has been said that it is necessary to put a clause in so that any construction of either brick or cement will not be allowed on the line of rain water leaders. That sand trap is nothing more or less than an old masons' trap. If it is necessary to have a sand trap, then it should be made by an inverted "Y" and cleanout on the vertical pipe.

Mr. Ochampaugh, Edmonton: I would like to see that each of those traps have a hand hole with a cover.

Mr. Mathias, Regina: It is likely that these sand traps are being installed in many cases and it is nothing more or less than a violation.

Mr. Adams, Regina: Won't your rain water clean your drains out? It is a practice to run rain water terminals to weeping drains.

Mr. Mathias, Regina: I am taking objection to that sand trap. If there is any leakage in that you will have no water, and it seems to me that you will be just as likely to lose 9" as a 4" or a 1½" seal. My idea would be to have a cleanout on the trap and a return that would be at the foot of the vertical pipe.

Chairman: In what form could that provision be stated?

Mr. Adams, Regina: No trap constructed of cement or brick work.

Mr. Nixon, Saskatoon: I learn that these are all brick built traps in Edmonton and that they are connected to the sanitary sewers. I think this is a very serious thing. If the water gets foul and you have a dry spell of three or four months, as we often have, that is going to be very dangerous. If Mr. Mathias wishes to add something to that clause whereby these traps can be cut out, I am sure Mr. Taylor will be only too glad to incorporate it in his motion.

Chairman: It has been moved that this recommendation be adopted with the provision that any form of construction allowing cement or brick to form a seal or trap, or in other words that mason traps be prohibited.

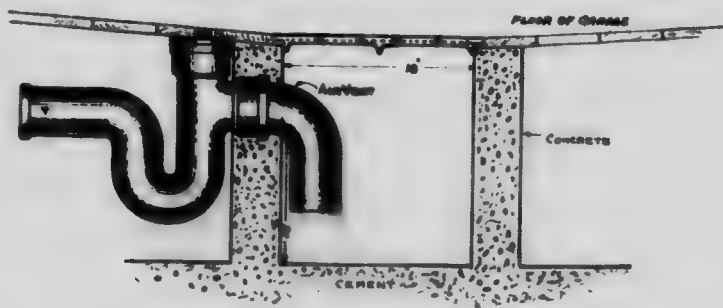
Motion carried.

Mr. Ochampaugh, Edmonton: I am in favor of a mason trap being used in a garage, but I would like to have an explanation of what we are going to do with the draining of garages. There is a great deal of mud washed off the machines.

Chairman: We are coming to the garage drains recommended by the Winnipeg committee. We will proceed with the general review of the By-Law. You will find the section referred to in the Winnipeg By-Law under section 21, we suggest that this clause be added. "Provided that the floor drain outlet of any garage shall be made in a manner approved by the Plumbing Inspector". Have you any further suggestion to make on this matter.

Mr. Mathias, Regina: I would like to have you give us an idea of how you propose to do them on the board.

Chairman: So far as we have gone at the present there are a number of patented fittings on the market controlling this matter, but we have had one or two built recently. I don't know that they will meet with your approval. It is somewhat in the shape of our friend's from Edmonton. This is not a trap, it is simply to catch the gasoline. There is a local vent here to prevent the air from locking in this section of the pipe. We have a trap here with the cleanout above the floor. We simply put this in to catch the gasoline. There are a number of iron traps similar to this.



METHOD OF DRAINING
GARAGE FLOORS.

Mr. Adams, Regina: All you have to do is to put a running trap inside of the basin. It is just the same thing, it will act as mud or gravel collector.

Chairman: We find that when there are too many fittings in the fixture it fouls.

Mr. Bulloch, Edmonton: In a gasoline trap the idea is to get rid of that gasoline. All the traps that are shown are provided with a local vent to take off the gas.

Mr. Swain, St. Boniface: I think we ought to go so far, to see that any trap approved by the local inspector must be equipped with a vent. It is a very important point and I would recommend that we add to the clause that the trap should have a local vent.

Mr. Taylor, Saskatoon: There is a clause here in Winnipeg By-Law which says that no steam exhaust pipe, boiler blow-off or drip pipe shall discharge directly into a house drain or soil pipe. Such pipe shall connect to a condensing or cooling tank of proper dimensions, etc. It seems that on these lines such a clause should be included governing garage drains.

Chairman: I appoint Mr. Taylor and Mr. Swain to draw up such a clause.

We will take section 25 now. Add to the end after "Accessible" "such cleanouts in all cases shall be formed by "Y" fittings and $\frac{1}{2}$ " bends or by special base fittings."

Mr. Ochampaugh, Edmonton: Does that cut out the Barret cleanout. We decided in Winnipeg to allow a Barret Cleanout.

Mr. Nixon, Saskatoon: It seems to me that the special base fitting meant is the St. Boniface base fitting, that is the bend with two inlets.

Mr. Lamson, Winnipeg: I don't know that every one here is acquainted with that St. Boniface fitting, if not, I have a cut upstairs.

Chairman: We have a cut on the wall.

Mr. Adams, Regina: I move that this clause be accepted.

Mr. Bulloch, Edmonton: I second it.

Chairman: Are you ready for the question?

Mr. Taylor, Saskatoon: It says here "such cleanouts, etc.," It seems to me that there is a call for cleanouts on a long run of drain.

Chairman: That would have to come under this motion.

Mr. Ochampaugh, Edmonton: Speaking on the question of eliminating the Barret Cleanout, which is as sanitary as your screw cleanout, I would like to ask before that clause is adopted, that there be a full membership here. I will make the motion that it be referred to this afternoon session.

Chairman: I think that motion is very good. I wouldn't like to settle anything on this matter without Mr. Fletcher here. We will put the amendment first, to refer it to the afternoon session.

Mr. McGrath, Saskatoon: I think it would be well if all the delegates would take a trip into the toilet room just off the bar and notice what condition that Barret Cleanout is in. The face of the plate is about one inch off its place. You can smell the sewer gas.

Chairman: All in favor of the amendment that this clause be considered this afternoon?

Carried.

We will take section 41 now. Add after the word "fixture" on first line "or drain inlet" and add to the end of section "and all floor drains from lavatories or kitchens shall discharge over a catch basin trap or water supplied fixture." The reason why this is suggested is, that in many buildings we have examined that have floor drains in lavatories we found that those drains were never sealed, and in one case we found under an operating table in a hospital a trap that was absolutely dry.

This is a very insanitary condition of affairs and we thought it necessary to bring in something to cover that matter.

Mr. Gothard, Wetaskiwin: I move the adoption of the clause as read.

Mr. Wharton, Winnipeg: I second that motion.

Mr. Taylor, Saskatoon: In regard to those floor drains we have an objection to this suggestion. We have got to make some provision whereby we can flush floor drains in school lavatories.

Chairman: I suppose in cases where large school lavatories are in the basement it is the general practice to flush it with the hose. In such cases there would be no objection to connecting the floor drain direct. I think that should be a matter for the Inspector's discretion. We have had that question up for consideration in Winnipeg. We could not get over the fact that we had to make a provision for a general lavatory.

Mr. Beaton, Saskatoon: An arrangement of this kind has come under my notice in the schools of Chicago, a number of which I worked on. They eliminated this drain from the toilet room entirely. They simply pitched the floor to the urinals which were the ordinary stall style with automatic flush.

Mr. Wharton, Winnipeg: That is a good idea too, but how did they apply it to the ladies lavatory? We have read of ladies lavatories where they are not flushed out at all.

Mr. Beaton, Saskatoon: The school board found that it was not necessary to take this into consideration in girls toilet rooms.

Mr. Nixon, Saskatoon: The London County Council do not allow floor drains in men's toilet rooms. They grade the floor to the urinals and they find it isn't necessary to provide drains in ladies toilet rooms or even in girls' toilet rooms in schools. Regarding kitchen floor drains I suppose it refers to kitchens in restaurants and hotels. You wouldn't put it in the ordinary house or the apartment kitchen.

Chairman: We find in large hotels, kitchens with floor drains where the hose is never used. They go over it with a mop and that never spills much water on the floor.

Mr. Adams, Regina: We had an instance of that down in Regina, perhaps the best restaurant in town, where they had two floor drains. And we pulled them up.

Mr. Mathias, Regina: Just one point. Suppose we have a floor trap with, we will say, 20 or 30 feet of return from it into a catch basin in the basement. I ask your opinion as to how the ventilation should be carried out; whether it should have a separate ventilation pipe carried to the roof, or whether it should be in some other position. It is for the purpose of maintaining a current of air which will keep the air within the waste pipe as near to being pure as possible.

Chairman: We have never considered it necessary to ventilate the waste pipe from the floor drain, and I think myself that it is going to put an additional expense on a house. We presume when putting floor-drains into the house there is nothing coming down to foul the catch basin and we never provided for ventilating it.

Mr. Mathias, Regina: That catch basin is not usually in the most cleanly condition and on the other hand the trap at the head of the pipe is likely to become unsealed.

Mr. Vallance, Lethbridge: Wouldn't it be better to say that traps depending entirely on water for sealing should not be used.

Mr. Nixon, Saskatoon: When you discharge waste from the floor of the urinal into the catch basin you are fouling the seal of the trap.

therefore you will be putting foul matter into the cellar. Take the small rooming house they slop the floor in other ways and if this floor has urine spilled on it, it may find its way into the basement and this basement may be used for a pantry. I think where you can't assure the seal in other ways it can be arranged when the building is first laid out, but we are not in a position to arrange the building in that way. Therefore where you can't arrange for water flush I think it is better to have a pipe for ventilation to make it as clean as possible. As an amendment I would propose that a committee bring in a report on this.

Mr. Wharton, Winnipeg: This is our last day. We get so near to completing this thing and then we put it back to a committee, it is too bad that we can't settle these little things at once.

Chairman: Is the amendment moved by Mr. Nixon seconded?

Mr. Blackwood, Saskatoon: I second it.

Chairman: All in favor of the amendment?

Amendment lost.

The original motion moved by Mr. Wharton and seconded by Mr. Gothard that the clause be adopted as read.

Motion carried.

We will now take up section 41, sub-section A. Add after the word "all" on first line "fixture and floor drain".

Agreed.

We will now take section 46. Add after the words "soda water fountain" the words "bar waste, soft water lifts."

Mr. McGrath, Saskatoon: I think we should go a little further into this bar drain proposition. I don't think we should just take down the bar drains and discharge them into a catch basin without some provision for keeping foul air from coming back into the bar. Personally I think all the fixtures should be separately trapped.

Mr. Mathias, Regina: I have some cases exactly as Mr. McGrath describes them. The odor is more general than where you get them ventilated with a vent to the roof. I would like to ask whether the traps should be put on the drain.

Chairman: No, I think not.

Mr. Beaton, Saskatoon: I think this is a custom that we will be away from within a year owing to this movement to abolish the bar.

Chairman: We will let Mr. Taylor and Mr. Swain bring in a recommendation dealing with this question.

We will take section 28. (By-Law 6949) to delete the words "fitted on cast iron pipe" and "screwed" and add to after the word "air tight" the words "by the use of graphite or graphite gasket". I would refer that matter until this afternoon with your permission. Under section 15 dealing with water tests we recommend to add to last line "the water test shall not be applied in extremely cold weather unless the premises are heated."

Agreed.

We will now proceed with the recommendation of Winnipeg committee on "Standardization of Brass Pipe and Fittings."

Mr. Nixon, (Acting Secretary) reads recommendations.

Chairman: There are some very radical changes recommended from last years findings. For instance we recommend that all brass pipes should be thoroughly annealed, seamless or drawn tubing cutting out the word "brazed", also we suggest that all pipe on the local side of traps, overflows and flush pipes shall be 16 Imperial gauge, that is the same gauge as we have at present on the sewer side of traps.

We are open for discussion.

Mr. Bulloch, Edmonton: I don't think any committees in the West have brought in a recommendation on this matter and I would move that it be laid over until next year for committees to bring in recommendations.

Mr. Taylor, Saskatoon: I think we have run up against this difficulty since plumbing started in this country. It is up to us to get some reliable brass traps and pipe. It is about the right gauge for the house side of the trap as well as the sewer and I think the recommendation should be accepted.

Mr. Gothard, Wetaskiwin: Does this do away with Clean Sweep traps?

Chairman: They were done away with years ago.

Mr. Wharton, Winnipeg: I certainly would like to see something done. We have been up against some hard propositions on the present tubing. You can get them in easy enough but the question is after they have been in for a little while and you go to disconnect them, the tubing splits from end to end and was so thick you could shave yourself with it.

Mr. Swain, St. Boniface: I would move that this standardization of Brass fittings be accepted.

Mr. Taylor, Saskatoon: I second the motion.

Mr. Nixon, Saskatoon: Speaking on the question it appears to some of the committee that they hav'nt been given a chance to get in on this. I think it is appropriate that we bring it in this afternoon. I think we have only to scan through and take notice of the various clauses to have a fair understanding of it. I move an amendment that this be discussed in the afternoon.

Mr. Gothard, Wetaskiwin: I second the amendment.

Chairman: All in favor of the amendment to defer consideration of the standardization of Brass Tubing till this afternoon.

Amendment carried.

We will consider suggested names for the special fittings. Names already suggested are "Arctic", "Edm", "San" and "Acme".

Mr. Wharton, Winnipeg: I move that it be C.I.S.E.

Mr. Beaton, Saskatoon: Probably this suggestion of Mr. Blackwoods was made in a spirit of frivolity, but I think it would be well for the committee to take it into consideration. It is "Samo".

Mr. Knechtel, Saskatoon: I don't think it is necessary to consider any more. "Samo" takes in pretty nearly all the provinces. I second the motion that we adopt the word "Samo".

Chairman: On being put to the vote the word "Samo" was adopted.

Mr. Huntbach, Edmonton: The committee on "Sizes of Soil, Waste and Vent Pipes", after sitting for 3½ hours, feel that the matter cannot be settled without much more consideration.

We first tried to settle the question of sizes of Soil and Waste pipes but finding that they are so intimately related to vent pipes, we had considerable difficulty and so tried to settle the question of Vent pipes and came to the same conclusion that we did with Soil pipes, viz: on account of the intimate relation between the two, one cannot be settled without the other.

We therefore request that this committee be authorized to remain in power for one year and also ask the privilege of adding to our number.

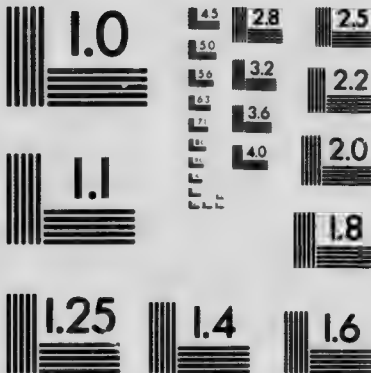
Chairman: Certainly.

Mr. Huntbach, Edmonton: We would like to take in B. C. and



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there are other towns and people who have never taken part in this matter.

Chairman: What is your pleasure Gentlemen?

Mr. Bulloch, Edmonton: Moved that it be adopted.

Mr. Gothard, Wetaskiwin: I second it.

Mr. Fletcher, Calgary: That suggestion from the committee is owing to the fact that a committee at last convention and dealing with the same question got into action on the last morning, the same as this morning and with the same result. If we can get the committee appointed on the morning of the first meeting of the session we will feel that we can discuss things far more thoroughly than coming in at the latter end.

Mr. Taylor, Saskatoon: We can surely get some definite clause to work under. This thing has been left over for a year. That didn't stop this committee from going into research work. It seems to me that a clause should be drawn up now and we could remedy this if more information was brought in next year.

Mr. Bulloch, Edmonton: I think it would be foolishness to adopt something now and then change it in a year. It would be preferable to give this committee power to bring in a proper recommendation and that is my idea in making the motion that the committee's report be adopted.

Mr. Taylor, Saskatoon: Talking on Mr. Bulloch's question some towns badly need a By-Law and some are working under By-Laws that need to be remedied.

Mr. Knechtel, Saskatoon: Speaking to Mr. Taylor's suggestion and for his information, any conclusion that we would arrive at and didn't seem fit to be adopted, would leave them amply within the laws at present. We find that in general adoption we would have to give way in a great many cases. We are a little bit conservative. So far as Saskatoon is concerned, we need have no fear, but other places are in sorry need of By-Laws, and immediately. I think if you admit that some Cities require something better than they have got this will be allowed to go on the minutes and things will not be up for some time in some of the Cities.

Mr. Taylor, Saskatoon: If this committee don't bring in a report at this Convention, we will have to abide our time. We will have to suit ourselves. If they bring in no recommendation at the next convention it means no new By-Law in the next two years. Whereas if they could get this thing on a working basis it would help two or three Cities considerably. If this committee come to a conclusion, it only means adding to the one clause.

Chairman: I think, for Mr. Taylor's information, there is plenty of data to go on for a number of months; there are specific recommendations and there are several organizations working on this matter very hard. I am in communication with Professor White of the Illinois University, and he is working on Vent and Soil pipe sizes. I think it will be entirely a waste of time if we were to adopt this recommendation. I think also that if any City desires to have a By-Law there is sufficient data on the table from the several committees that could be used to form a By Law to work on for a number of years. It is quite impossible to get a recommendation that will not be changed next year. All the committees are going back to make thorough experiments in their different Cities; but for the information of the Cities who want a change there is sufficient data on the table at the present time.

Mr. Taylor, Saskatoon: We can complete our By-Law with the exception of clause No. 34. If we can take that number 34 clause up then we can complete our By-Law.

Mr. Knechtel, Saskatoon: What is the clause?

Chairman: Clause 34, it is only fairly satisfactory.

Mr. Taylor, Saskatoon: I make a motion to that effect.

Chairman: Your amendment to adopt section 34 would be a negative one. The motion before us is that the recommendation of the committee be adopted and defer consideration until next year.

Mr. Huntbach, Edmonton: In that connection we tried to arrive at some particular conclusion to define that clause as much as possible. We thought it impossible to define one clause without defining the rest. We left it in such form that we could revise it if necessary after we got into the question of vents. We couldn't bring in a recommendation to put the clause in the By-Law or to move that it be put in the By-Law, so we requested that the committee be left in power to determine what that clause will be. It looks to me that it would be out of order to put in a clause that we know will be changed next year. In taking the By-Law to the Provincial Board we would have to admit that it would have to be changed next year. As our individual By-Laws are sufficient to cover the matter, why not let that go through. I find it is hard to get a Council to give us anything. If they once give us a By-Law they say "there you are", and imagine that is enough for ten years.

Chairman: The motion is to adopt the recommendation.

Motion carried.

The motion to adjourn is in order. We will adjourn until 2 o'clock.

May 6th, 1914, 2 o'clock, p.m.

Chairman: Come to order, gentlemen. I expected there would be a larger representation here as we are going on with the consideration of "Examination of Plumbers" meantime we can have the report of the Committee appointed this morning.

Mr. Taylor, Saskatoon: Here is the committee's report on "Garage Drains", "Bar Fixtures" and "Drinking Fountains". I will hand them to the Secretary to read.

Mr. McFarlane:

Drinking Fountains. All waste from drinking fountains shall be separately trapped and shall discharge into a catch basin or open fixture properly trapped except that in cases where two or more fixtures are connected to waste line, said waste shall be extended through roof of premises.

Bar Fixtures: All bar fixtures shall be separately trapped and the waste pipe from same shall discharge into a catch basin or open fixture properly trapped, said waste to be extended through roof as a vent.

Garage Drains. No garage drain shall discharge directly into a house drain or soil pipe. Such pipe shall connect to a catch basin of proper dimensions, to be determined by Plumbing Inspector. The discharge pipe from catch basin shall connect with house drain and shall be provided with such traps as may be necessary to prevent the ingress of gasoline, and solid matter into house drain. A local vent must be taken from catch basin and carried to roof.

Chairman: We will take up the report of the committee on drinking fountains first, what is your will and pleasure?

Mr. Swain: I move the adoption of the report.

Mr. McGrath, Saskatoon: Speaking on the question I am in favor of the suggestion, but I would like to see it worded different. That word "Except" is not the proper word in that place. I don't quite understand the meaning of the motion. Would it allow one drinking fountain to go without being vented?

Mr. Taylor, Saskatoon: If there is a better word than "except" I think we might put it in.

Chairman: Suppose we take out the word "Except" and put in "provided".

Mr. Nash, Edmonton: I move that it be adopted with that alteration.

Mr. Adams, Regina: I second the motion.

Chairman: You have the motion, gentlemen.

Motion carried.

Chairman: You have heard the report of the committee on "Bar Fixtures". What is your pleasure?

Mr. Wharton, Winnipeg: I move the adoption.

Mr. McGrath, Saskatoon: I second it.

Chairman: Motion carried.

Chairman: You have heard the suggestion of the committee on "garage drains". What is your pleasure?

Mr. Bulloch, Edmonton: I move the adoption.

Mr. Huntbach, Edmonton: I second it.

Mr. Taylor, Saskatoon: In connection with the size of catch basins, it seems to me that it is a hard matter to determine the size of these.

If you have a garage of 30 or 60 cars, it is going to be much larger than for a smaller garage.

Chairman: Motion carried without further discussion.

Chairman: There is an application for membership from A. L. Milligan, Calgary.

Mr. Fletcher, Calgary: I move that it be accepted.

Mr. Taylor, Saskatoon: I second it.

Chairman: Motion carried.

We will now take up "Standardization of Brass Pipe and Fittings" which was deferred until this session. I trust you have all made yourselves familiar with the recommendation in the interval.

Recommendation for Standardization of Brass Pipe and Fittings.

Clause 1. All brass pipe used for soil, waste and vent pipes shall be thoroughly annealed seamless drawn tubing having not less than the outside diameter, weight and thickness and gauge set forth in the following table:

Outside diameter of pipe	Weight per lineal foot	Thickness in inches	British Imp. Wire Gauge	Brown & Sharp gauge
1 1/4 inches	0.88 pounds	1-16 inch	16.	14.
1 1/2 "	1.06 "	1-16 "	16.	14.
2 "	1.54 "	1-16 "	16.	14.
2 1/2 "	2.83 "	7-64 "	12.	10.
3 "	3.41 "	7-64 "	12.	10.
4 "	5.74 "	1/8 "	10.	8.
5 "	7.22 "	1/8 "	10.	8.
6 "	8.71 "	1/8 "	10.	8.

Clause 2. All brass pipe used for outlets from fixtures, overflow pipes or flush pipes or any part of a waste pipe on the local side of any trap shall be not less than 16 British Imperial Wire gauge or 14 Brown & Sharp gauge, and all Tees, couplings and fittings on such pipes and traps shall be of heavy cast brass, with iron pipe or standard brass threads.

Clause 3. Brass pipe fittings with screw joint connections shall have not less than the following number of threads per inch and depth of bite.

Size of pipe	Number of threads per inch	Depth of bite
1 1/4 inch to 2 inch	20	1/2 inch
2 1/2 " 3	12	3/4 "
4 " 6	12	1 "

Clause 4. Brass drainage fittings and traps shall be recessed, and of first quality cast brass, having a smooth interior, and thickness in their walls, of not less than twice the tabular thickness given in the table of brass pipe sizes. The recessed parts or sockets shall be at least one and a half times the thickness of the wall of fittings.

Clause 5. All connections between brass pipes and iron pipes shall be made by a brass threaded bushing with a standard iron pipe thread outside and a standard brass thread inside, and all brass fittings and traps shall have legibly stamped on a conspicuous place the name or trade mark of the maker thereof.

Clause 6. All brass water supply pipes shall be of iron pipe gauge and all threaded connections on such pipes shall be equal to iron pipe threads for same size of pipes and shall be tapered. In no case shall slip joints be made on water supply pipes. The diameters and weights per lineal foot of all brass tubing used for this purpose shall be not less than set forth in the following table.

Diameter	Pounds per lineal foot
$\frac{3}{8}$ inch	.62 pounds
$\frac{1}{2}$ "	.90 "
$\frac{3}{4}$ "	1.25 "
1 "	1.70 "
$1\frac{1}{4}$ "	2.50 "
$1\frac{1}{2}$ "	3 "
2 "	4 "
$2\frac{1}{2}$ "	5.75 "

Clause 7. All fuller bibbs or taps are prohibited and the mechanical parts of all ball cocks must be above the water level. All water supply pipes to flush tanks shall be provided with compression stop cocks and all compression stop cocks shall have a packing box.

All brass goods must be approved by the Plumbing Inspector.

Chairman: We will deal with the clauses individually.

Secretary: reads clause No. 1.

Mr. Taylor, Saskatoon: I move that this clause be adopted as read.

Mr. Bulloch, Edmonton: I second that motion.

Chairman: Motion carried.

Secretary: Reads clause No. 2.

Mr. Needham, Chatham: What is the reason for making the house side of traps so heavy?

Chairman: In answer to Mr. Needham's question there is a feeling that there is a good deal of this pipe used on the local side of the traps that is very poor material. It may seem that our opinion as expressed in this report is exaggerated to you. We would like to hear from Mr. Needham.

Mr. Needham, Chatham: What is the weight of the tubing now used? Nineteen Imperial Gauge is it not?

Chairman: There is no standard in Winnipeg. The average is from 19 to 20.

Mr. Needham, Chatham: Don't you think it is a radical change from 19 to 18.

Chairman: We want it standardized. If the feeling is that 19 is heavy enough, we want it 19, if not, we want something heavier.

Mr. Huntbach, Edmonton: Have we any samples of the different gauges?

Mr. Needham, Chatham: You may look at these samples that are here.

Mr. Huntbach, Edmonton: I would like to see the weight of them.
Mr. Swain, St. Boniface: Are the gauges mentioned manufactured now?

Chairman: No, they are not on the market at present.

Mr. Swain, St. Boniface: Then by our adopting this clause all the manufacturers will be put on the same footing.

Mr. Kidd, Edmonton: I would sooner see them a little bit heavier than they are. I have had some tubing so thin that I could cut them with the scissors, or a pen knife. It is not heavy enough now. If the plating was off the brass fittings there wouldn't be anything left.

Mr. Adams, Regina: What gauge is specified for the local side of traps now?

Chairman: There is no specific gauge for the local side. That is the reason that we bring in this suggestion.

Mr. Knechtel, Saskatoon: 16 gauge is just heavy enough, I don't see any reason for the overflows to be as heavy as that. The trouble has been that they are not all alike.

Mr. Taylor, Saskatoon: In connection with this matter it seems Mr. Needham can't say where it is going to be any more disadvantage to the Manufacturers that it has been to us. I think it is up to the manufacturers to bear this and a little bit more. We have a good trap as far as the trap is concerned. It has been proved that the local side of the trap is far too light. What we want, is to have it the same gauge throughout.

Mr. Kidd, Edmonton: In reference to it being a hardship on the manufacturers, we don't want to leave them with a lot of material on their hands. The Plumbing Inspector should allow them so much time to work off their goods.

Chairman: That is our intention.

Mr. Swain, St. Boniface: Is there any brass tubing manufactured in Canada?

Mr. Needham, Chatham: We have two factories here and we can't make enough to suit the trade. That is our experience East and West of here.

Mr. Wharton, Winnipeg: I don't see where the fact of raising the standard up to 16 gauge will hurt the manufacturer. He is already producing 16 gauge on the sewer side of the trap, and if he puts 16 gauge on the local side he would have to charge for it. I think that devolves this way, that everybody is getting a benefit from it. I don't see why we shouldn't get 16 gauge on the local side of the trap as well.

Mr. Needham, Chatham: Does that mean that all the traps will have to be cast brass?

Chairman: Yes. Do you make a drawn tube trap?

Mr. Needham, Chatham: Yes, there is one here.

Mr. Nixon, Saskatoon: I believe this refers to the catch bowls of the trap.

Mr. Needham, Chatham: It distinctly says traps. If you accept that report as it is now, every drawn tube trap will be closed out of the market. I think the trouble is in the wrong interpretation. The way it reads now, it is very liable to allow discrepancies to creep in.

Mr. Knechtel, Saskatoon: I move that you cut out that word "cast".

Chairman: If you cut out the word "cast" you will have the whole thing settled.

Mr. Needham, Chatham: Now would it not be as well to make two clauses out of that?

Mr. Knechtel, Saskatoon: I think this clause and clause No. 4. are

rather conflicting. You say here "traps shall be of heavy cast brass" and then in clause No. 4 you say "traps shall be recessed and of first quality cast brass." It seems to me you are just adding a little to it. I think if the essential points of the two clauses were combined under one clause you would have it simplified.

Chairman: I will refer these two clauses to a committee of two to report. I will appoint Mr. Knechtel and Mr. Needham. While this committee is considering this matter, we will proceed with the other clauses.

Secretary: Reads clause No. 3.

Mr. Nixon, Saskatoon: I move that we adopt this clause as read.

Mr. Carse, Edmonton: I second the motion.

Chairman: Motion carried.

Secretary: Reads clause No. 5.

Chairman: Agreed unanimously.

Mr. Nixon, Saskatoon: Don't you think it would be better to intimate in this that it refers to sanitary and not to water systems. This heavy connection refers to trap connections. I think we should make some distinction there.

Adopted.

Mr. McFarlane: Reads clause No. 6.

Mr. Adams, Regina: That table is stronger than the iron pipe size. 1½ inch iron pipe weighs about 2.68 pounds, while on this table 1½ inch pipe weighs 3 pounds.

Chairman: I think those weights are based on iron pipe standard.

Mr. Wharton, Winnipeg: I move the adoption of that as read. One thing I would like to point out that all threads should be tapered. Up to the present time we have not been getting that. The average pipe that we get screws right up to the shoulder on the fitting, consequently you have to sweat it in.

Mr. Maxwell, Edmonton: It says here that in no case shall slip joints be made. I have used them for years. You have a better joint on a slip joint than if you caulk it in. I would object to the words "slip joint".

Mr. Bulloch, Edmonton: There is one job in town where it is finished with self closing bibbs. The job was only finished last fall. That building has sunk about 2 inches and there are about a dozen of the 15 bibs broken right off at the shoulder, and if there had been a slip joint, there would have been some play there.

Mr. McFarlane, Winnipeg: To my mind gentlemen, it is not a safe joint. We have come across some of these connections where the brass pipe was only inserted ¼ of an inch into the iron pipe, at the time of inspection these were tight but a few months afterwards the building had settled with disastrous effects to the ceilings. As to the settlement of the walls that is a condition of affairs outside of our jurisdiction, but I think we should insist on having all joints on water pipes made with screw joints.

Mr. Kidd, Edmonton: I think that any plumber that makes a slip joint with a ¼th inch shoulder should lose his license.

Mr. Maxwell, Edmonton: I was going to say on rigid joints some years ago we thought that lead was the only thing to connect up a stove with. Today we have got down to where we use the slip joint, and it is up to the plumber to see that it goes in far enough so that it will have plenty of play. Let it go in an inch or two inches, and your

joint will be less liable to leak. It is a much nicer way to do it than to have a rigid joint to my way of thinking.

Mr. Adams, Regina: I would suggest that we add to this "except directly at the joint at the base of the particular faucet." I think it is a good thing to cut out such joints at the floor. I think that everybody will agree that slip joints at the floor are not very satisfactory.

Mr. Fletcher, Calgary: You are talking about slip joints on water supply pipes, I don't think we have any jurisdiction over that.

Our jurisdiction is public health, and I don't think we could discuss matters of that nature.

Mr. Swain, St. Boniface: I take exception. This organization is for sanitary conditions and we are taking up the plumbing By-Laws, and I think it is in our jurisdiction.

Mr. Nash, Edmonton: While I don't think we have anything to do with the water pipes any more than we have to say about their feeding water through a meter, slip joints I have found good but slip joints with a rubber washer are absolutely useless.

Mr. Maxwell, Edmonton: I move that the section be adopted with the words "slip joints." struck out.

Mr. Bulloch, Edmonton: I second the motion.

Mr. Adams, Regina: I move an amendment to that, I move that these words be added "except at the faucet or bib."

Mr. Huntbach, Edmonton: I second that amendment.

Mr. Maxwell, Edmonton: With the consent of my seconder I will withdraw my motion.

Mr. Wharton, Winnipeg: I move an amendment that the clause be adopted as read.

Mr. McFarlane, Winnipeg: I second that amendment.

Mr. Fletcher, Calgary: I move an amendment to the amendment, that it be referred to a committee inasmuch that it is not complete and it doesn't state anything about drainage of pipes. It is simply as far as I am able to gather referring to this slip joint.

Mr. McFarlane, Winnipeg: If you will look at section 85 of the By-Law you will see it deals thoroughly with grading of water pipes.

Mr. Fletcher, Calgary: How about the trapping of these pipes, the unavoidable trapping I mean.

Chairman: The amendment is that the clause stand as it is. Are you ready for the question?

Amendment lost.

Chairman: The motion is that the clause stand as read with the exception that these words be added after the word "pipes" on the fourth line "except at the joints at faucets".

Motion carried.

Mr. McFarlane: Reads clause No. 7.

Mr. Bulloch, Edmonton: I move that it be adopted.

Mr. Wharton, Winnipeg: I second it.

Chairman: Are you ready for the question?

Mr. Fletcher, Calgary: Suppose we as a body adopt this section to go into a standard code. Could we with any reason put forth any reasonable argument to present to the Provinces and could we make it stick in any court of law?

Chairman: I think we could.

Mr. Fletcher, Calgary: You can't make any plumbing By-Law unless it deals with the public health or safety. It is merely an opinion

on our part that Fuller Bibs are dangerous to the water supply system. For my part I don't think we can make any such thing stick.

Mr. Ochampaugh, Edmonton: Where it is necessary to put them in for personal reasons we shall be obliged to put them in.

Mr. Maxwell, Edmonton: All Fuller Bibs from my experience have proven that they last longer and give better service than any other bib made. I have had them in my own house without even putting in a ball for over 7 years. There are lots of cocks made that are not Fuller cocks at all. As it is not detrimental to public health I do not think we should say anything about Fuller bibs. I would object to that clause.

Mr. Taylor, Saskatoon: In connection with this clause doing away with Fuller bibs. The installation of Fuller bibs is up to the consumer.

Mr. Nash, Edmonton: I move an amendment that the whole clause be struck out.

Mr. Fletcher, Calgary: I second that.

Mr. Swain, St. Boniface: Taking the Fuller bib I will not say anything for it or against it. You seem to think that water hasn't anything to do with health. Now, speaking as a water inspector on the point of supply, you will find it absolutely necessary to have a stop cock on flush tank supplies. The water is costing you but a small part of what is spent to protect the water system.

Mr. Nash, Edmonton: I would like to ask my friend a question. Suppose your ballcocks are leaking, will the people shut them off.

Mr. Swain, St. Boniface: Yes, they will. We learn we have to pay for what we get.

Mr. Nixon, Saskatoon: I am sure we are outside of our province in this water question.

Chairman: We will now vote on the amendment to the motion, that this whole clause be struck out.

Amendment carried.

Chairman: We will now have the report of the committee on clauses 2 and 4 of this recommendation.

Mr. Needham, Chatham: Your committee beg to recommend that these clauses be combined and shall read as follows:—"All brass pipe used for outlets from fixtures, overflow pipes, flush pipes or any part of a waste pipe on the local side of any trap shall not be less 16 Imperial Gauge or 14 Brown & Sharp Gauge, and all Tees, coupling and fittings on such pipe shall be heavy cast brass with iron pipe or standard brass threads and all such fittings, couplings, etc., shall be recessed and of first quality brass, having a smooth interior and thickness in the walls of not less than twice the wall thickness of tube specified in table of brass pipe sizes."

"Cast brass drainage fittings and cast brass traps shall be recessed and of first quality brass having a smooth interior, and a thickness in their walls of not less than twice the wall thickness given in the table of brass pipe sizes. The recessed parts or sockets shall be at least one and a half times the thickness of the wall of the fitting."

Chairman: What is your will and pleasure?

Mr. Wharton, Winnipeg: I move that the report be received.

Mr. Bulloch, Edmonton: I second the motion.

Chairman: Are you ready for the question?

Motion carried.

Chairman: We will now go on to the programme of "Examination of Plumbers". We will hear what the various committees have recommended.

Winnipeg Recommendation.

- Whereas examination of plumbers is considered necessary for the proper protection of public health, and
- Whereas such examination should be of great benefit to public health and raise the status of the plumbing trade.
- Be it resolved that this meeting of the Winnipeg branch of the Canadian Institute of Sanitary Engineers go on record as favourable to such examination provided that said examinations are conducted by local examining board under the authority of a Provincial Plumbing Inspector appointed by the Provincial health Board, who will either by himself or by his Assistant be represented at all examinations held in the Province over which his authority extends. Said Provincial Plumbing Inspector shall also be empowered to see that proper inspection of plumbing is maintained in all rural and urban districts and have power to appoint a sufficient number of inspectors to carry on this work where such is not done by the several Municipalities; and
- Be it resolved also that such examination shall consist of — for Master plumbers not desiring to have a license to work with the tools, a theoretical examination — for Master Plumbers desiring to have a license to work with the tools or for Journeymen Plumbers; a theoretical and practical examination.

Recommendation of Saskatoon Committee.

Examination of Plumbers:—

That no person, firm or corporation shall act as, or do any work as, a Master or Journeyman Plumber unless he or they have a certificate, which certificate shall only be obtained after the candidate shall have passed a satisfactory and practical examination. It shall be sufficient if one member of a firm hold a certificate. This certificate shall be good for any part of the Province in which it is issued.

One man shall be appointed by each Province as Chief examiner of Plumbing, who shall act as clerk to the Provincial Examination Board and shall visit the various centres at stated intervals for the purpose of holding examinations.

There shall be an examination board in each of the examination districts of the Province, (N.B. We find that Saskatchewan divide up into twelve examination districts composed of an average of 46 Rural Municipalities) with headquarters in the Principal Town or City in the district, consisting of the local Plumbing Inspector, one Master and one Journeyman plumber of the Town or City, which board shall have power to take applications for examination and also to give permits to those they think qualified to work until such time that they can be examined. The application shall be immediately forwarded to the Chief examiner and the permits given shall be subject to his veto, should he so direct, if these therefor exist.

The persons to serve on these local examination boards shall be recommended by the City Councils of over 10,000 population, or where none exist in the district, the three chief towns of the district, having sewer and water.

The appointments of examiners will be made from these recommendations, by the Provincial Board of Health, who shall have the power to revoke any certificate for infractions of the By-Laws and to enforce the penalties hereinafter set forth.

The application fees shall be held by the Local Plumbing Inspectors until examinations, when they shall be paid over to the Chief Examiner.

Seeing that examination without inspection in conjunction is a farce, we recommend that all Cities of 10,000 population or over in any examination district, a Plumbing Inspector shall be maintained by that district, who shall locate as determined by the Provincial Board of Health.

Where there is a City of 10,000 population or over, within the examination district, the Provincial Board of Health may approve of a joint appointment of the City Inspector or Inspectors, for the City and the outside district.

The Saskatoon Committee have searched the plumbing examination ordinances of every state, having such, in the country South of the International border and have used their best endeavours to pick the best out of them and modify them to Canadian condition.

Mr. Maxwell, Edmonton: In the Saskatoon recommendation it says that all cities of 10,000 population or over shall maintain a Plumbing Inspector. We are here to maintain not only the health of those Cities but the whole Province.

Chairman: I think you will find that covered a little further on.

Mr. Taylor, Saskatoon: I would like to hear Mr. Fletcher on these examinations. I think he has followed them along pretty closely.

Chairman: We have deferred bringing this up until Mr. Fletcher was with us.

Mr. Fletcher, Calgary: I believe I introduced the subject at our last Convention. I think I outlined what my opinion was in regard to the value of this procedure. Now, we consider that it is necessary and important that we get together here and discuss the manner of installation and plumbing. We may be very wise men, but if we can't go back and ask men who actually instal this work a reasonable number of questions to satisfy ourselves that they know enough to install plumbing, and if they do not answer a reasonable number of the questions asked I would consider them too ignorant to work at the trade. Now from the experience I have had I advocate that the sooner we get this proposition the better because it is a great handicap to the trade to have men coming and going all the time. It has been a fault with the trade and the fault has been that they who make the examinations do not appreciate that the applicant has taught himself to a great extent. The report of the soil pipe committee this morning shows that we didn't know enough to bring in a proper recommendation as to the size of the pipe. It is up to us to educate ourselves. Our experience in the examination of Plumbers in Calgary has extended over five years and it would surprise you to know how many men were ignorant that came up before us for examination. We have passed men through because of pressure of business that by rights shouldn't pass, but if the examination was Provincial it rather gets above that sympathetic movement. They would realize that Calgary was not enforcing a hardship on them any more than Saskatoon, Edmonton or Lethbridge. The Provincial Government fixes it that a man running a threshing outfit must have a certificate and if there is any comparison between the two occupations I would like to see it. They enforce that man to answer certain questions in regard to running

an engine. Why shouldn't we ask a man who is installing sanitary Plumbing to ascertain why he does certain things on certain work. As intimated by Mr. Nash the matter of wiping joints can be done by any telephone man. I have seen ladies that could wipe joints as good as any man in this town. Our examination in Calgary is merely theoretical because we cannot give a practical test. A practical man could tell by the way a man picks up a ladle and cloth whether he can wipe a joint or not. To have a practical examination that was worth while would need a large room and a large amount of material and would consume a large amount of time. If we would give the time necessary for all the applications that come up in Calgary we would have to devote our whole time to it. This examination brings forth a better class of men and in that way the greatest benefit to the trade will be realized. Even the immediate benefit is noticeable. Eventually it will bring in a more intelligent class of men to the profession. Take our educational system and from childhood up we have statutes that compel the child to go to school until 14 years. Why shouldn't we compel the boys to reach certain qualifications in their work. Of course, these men who claim they have reached the journeyman or Master Plumber's stage we can't shove them back but it is never too late to learn. Sometimes I think what is termed a practical man is turned down on a theoretical question and a man that is able to answer the theory part should know something that the other man doesn't, but I would say that it is not of much use for one community to introduce this matter unless we can bring pressure to bear on the majority of the Provinces to make it universal throughout Western Canada. I might say in conclusion that it has been my observation that it is the trend throughout the country that the examinations be held by State or Provincial Boards.

Mr. Knechtel, Saskatoon: I won't attempt to elaborate on what Mr. Fletcher has told us. It seems to me that it is a great pity that many are content with the little that they can pick up without any trouble. Take for instance, doctors and dentists are men who have to put in a great length of time to prepare for their profession. It seems to me that our profession belongs to that class, I don't know whether it is any more disgraceful to work around a sewage pipe than it is to work around the mouths of people who carry living sewers in their mouths. I don't see why it is not just as reasonable for the professional plumber to be lifted to this high plane. So for the very reason that these men have to put in a certain length of time to get their degrees is sufficient reason that the profession of plumbing needs more education. I think that we must favor the man who will supply himself with theoretical knowledge as well as practical knowledge.

Mr. Swain, St. Boniface: The City of St. Boniface have a By-Law governing the licensing and examining of plumbers. In reply to a suggestion made here as to whether a local examination was better than a Provincial examination, personally I hold strongly for the Provincial examination, for this reason, that it eliminates favoritism. Believe me, gentlemen, there was a man who came up to St. Boniface from the East who didn't know a stack from a sand trap. I was told by a couple of Aldermen that they wanted him to go through. We had a little meeting up in our office and we took the question up, what are we going to do? As far as I am concerned it don't make any difference who his friends are, if he doesn't pass the examination we will fire him out. About three days after that three other Aldermen wanted another man to go through and we called another meeting. It seems to me we have got to

have a Provincial Examining Board. Because where you have a small community that is the kind of influence that is exerted on the examining board. We repealed that portion of our By-Law altogether and it died a natural death, but we want a Provincial Examining Board. The question has been raised as to whether you can enforce this. You have in your City charters By-Laws to cover these conditions I don't think any city would be foolish enough to make any By-Laws where they have no chartered provision to have a special act put through. That By-Law of ours has become ratified. We can proceed and carry this into force but we do not want to carry it into force because of the hardship on the people who are examining.

Mr. McGrath Saskatoon: I have studied this question for a good many years. I first took out an examination and got my license in 1896. You understand the law in the States requires that most of the Cities have examination boards. For that reason I have studied that question and it is a hobby of mine. The arguments put up are simply in favor of licensing plumbers. Whether it is going to do any good to license the plumber is a question, but it will not make them better men, and I say that a man who knows that he must take an examination will prepare for it. You will be forcing him to study the theory of plumbing as well as the practice. If a man knows he must go before an Examination Board he will prepare himself. If he falls down in his examinations the Journeymen plumbers don't want him in the trade and the City and the Public have no use for him in the trade. Now as far as the legality of the act is concerned, there is no question about that as explained by the member from the Holy City. If we haven't got the power we can secure the power. The cities have every means by which they can make it legal. Practically 75 per cent. of the States that have state laws compelling the licensing of Plumbers, originally had City Examining Boards. When this first came up we strongly objected to it, we thought it was a pull on the part of the bosses to down us. Latterly we saw where it was an advantage to us, that it was uplifting us, and making our trade what it should be, a profession. You will agree with me that both the Master and Journeyman Plumbers find it a good thing. Mr. Ochampaugh said he turned out a plumber in six months, he didn't do it. He taught him to do a little job but he can't be a Plumber. Mr. Ochampaugh has been using this man for certain parts of work and he is all right for that but that is all. Further, I think a man should be compelled to serve six years.

Mr. Ochampaugh, Edmonton: I might say that the man in question has already received his examination papers from the City of Edmonton. I say if the examination was what it should be, he wouldn't have passed that examination, if he is not a full fledged plumber. I did not intend to say that the examination of plumbers would not benefit the plumbers. What I am arguing against is, you will be keeping him from passing your examination, if the examination is what it should be. He could not pass it for some time. Any plumber who knows anything about the work can pass it. I say if we are going to have that kind of examination we don't want it. Let us not have a make believe examination.

Mr. Swain, St. Boniface: May I ask how long after this man served his six months did he have his examination?

Mr. Ochampaugh, Edmonton: A little over a year. I would like to know if provision is made in your By-Laws that a man be given a temporary certificate to work if he fails in his examination; you don't hold him up from work. If that man puts in a plumbing job and it is

passed by an inspector where is your evidence that this man isn't capable of putting in work.

Mr. Swain, St. Boniface: The Plumbing Inspector is not the judge whether he is going to pass his examination.

Mr. Nixon, Saskatoon: In regard to this question of examination of Plumbers. Mr. Ochampaugh speaks of what he turned out. We might go on that way forever. If you take the same stand on "standardization" where would we be now? As Mr. Fletcher said the trend of America is towards state plumbing law and state examination.

Mr. Swain, St. Boniface: I move that the resolution of the Winnipeg Committee on "Examination of Plumbers" with the exception of last clause be adopted.

Mr. Robertson, Regina: I second that motion.

Chairman: Motion carried.

Mr. Adams, Regina: I move that the clause excepted in the last motion be adopted with the words from "for" on the first line to "examination" on the third line, and from "desiring" on the fourth line to "for" on fifth line deleted.

Mr. Gothard, Wetaskiwin: I second the motion.

Chairman: Motion carried.

Mr. Knechtel, Saskatoon: I make a motion that a Legislative Committee be appointed to draft a By-Law covering all the work done at Winnipeg and here, and to consider all suggestions submitted to them and report at our next Convention.

Mr. Campbell, Medicine Hat: I have much pleasure in seconding the motion.

Chairman: We will require to have a Legislative Committee anyway. Gentlemen, you have heard the motion made by Mr. Knechtel.

Motion carried.

Chairman: I would make the Legislative Committee the Vice-Presidents and Directors of the Institute and they shall have the power to consider all forms of Sanitation Laws if they so desire. The chairman of that committee will be Mr. Huntbach. There is a resolution from the Winnipeg committee favoring technical education.

Mr. McFarlane reads recommendation.

RESOLUTION

On the Encouragement of Technical Education

WHEREAS this meeting has gone on record as favorable to Examination of Plumbers, and

WHEREAS such Examination of Plumbers is unreasonable without education both practical and theoretical.

BE IT RESOLVED, that it is the sense of this meeting that we should as far as possible encourage technical education particularly in the larger cities of Western Canada, and

BE IT FURTHER RESOLVED, that all members of this Institute urge on the school boards in their cities the necessity for technical education in plumbing, and

BE IT FURTHER RESOLVED, that a copy of this resolution be sent to all the school boards in cities represented by membership in this Institute.

Mr. Huntbach, Edmonton: I would like to move the adoption of this resolution.

Mr. Swain, St. Boniface: I second the motion.

Chairman: Motion carried.

Chairman: There are just two small items here dealing with the By-Law, first is the recommendation of the Winnipeg committee on sections 25 and 28 regarding cleanouts. We suggest that at the end of that clause the following words be inserted: "Such cleanouts provided by special 'Y' fittings."

Mr. Gothard, Wetaskiwin: I think that alludes to the Barrett clean-out.

Mr. Knechtel, Saskatoon: I would like to ask the Edmonton man if that is a Barrett Cleanout in the toilet room here?

Mr. Huntbach, Edmonton: Yes, it is.

Chairman: What is your will and pleasure in regard to this matter?

Mr. Fletcher, Calgary: I move that it be referred to the Research Committee.

Mr. Huntbach, Edmonton: I second the motion.

Mr. Knechtel, Saskatoon: I move that the Research Committee be authorized to accept sample drawings of ideas on the screw cleanout and then half a dozen or dozen samples made and sent around to the different cities.

Chairman: It is moved that it be referred to the Research Committee to have samples made and sent to the different cities. And that the cities representatives will report their findings to the Research Committee, who will refer their decision to the Legislative Committee to incorporate them in the By-Law.

Motion carried.

Mr. Nash, Edmonton: I would like this Convention to go on record as favorable that the Plumbing Inspectors have a separate and distinct department to be known as the Plumbing Department.

Mr. Gothard, Wetaskiwin: I second the motion.

Chairman: Motion carried.

It seems to be Mr. Fletcher's misfortune to come into this meeting with some paper which he desires to read, and not get a chance until the last moment. We will now hear a paper by Mr. Fletcher, on "Explosions in Sewers."

Mr. Fletcher, Calgary, reads paper.

EXPLOSIONS IN SEWERS AND CONDUITS

The cause of various explosions in sewers is often published in the newspapers as "Sewer gas explosion" but while the explosion may take place in a sewer man-hole, the cause is generally from illuminating gas, gasoline, calcium carbide and hydro-carbon oil, (a by-product of Pintsch gas).

The prevention of these explosive gases, liquids or gas generating substances, entering our sewers or conduits and overcoming the difficulty if they do enter, is a subject which we should consider in the interest of public health and safety.

Illuminating gas (natural or artificial) enters the sewers from broken mains or leaky joints, and when mixed in the proper proportions with air forms a highly explosive mixture.

Gasoline is conveyed to the sewers in large quantities from public and private garages, and it is said that one volume of gasoline produces one hundred and forty-one volumes of vapor, and one part of this vapor to sixty-two and a half parts of air furnishes a mixture which is highly

explosive and although it takes an open flame to ignite it, this is often furnished by sparks from electrical apparatus and from fire engines passing over man-holes. While illuminating gases are lighter than air, gasoline vapor is heavier, therefore the use of ventilated man-hole covers will not always allow them to escape. Calcium carbide used to a large extent in garages for generating light is very often thrown into the floor waste opening, and when in contact with water, generates acetylene gas which is an intense explosive as was demonstrated at Macoun a few days ago, and as this gas is auto-combustible, in many cases it is lighted by its own heat generated in the process of being transformed to gas.

Hydrocarbon oil under low temperature forms crystals which are soluble in water forming an explosive gas.

There have been a large number of explosions from these gases, some of which caused loss of life, and others the destruction of sewers. Expensive fires in which the insulation on wires and cables in conduits were burned before they could be extinguished are also of frequent occurrence.

The source of these troubles is largely from the following:—

- Private and Public Garages.
- Dry Cleaning Establishments
- Gas Mains and Connections.
- Lithographing Plants.
- Oil Storage Warehouses.

The first two difficulties arising from these places must be met, in my opinion, first by preventing as far as possible the discharge of these volatile inflammable oils into the sewers, and secondly, so constructing the sewerage system to allow the vapors to escape.

In the first place, ordinances should be designed to protect sewers from combustibles. The Washington ordinance which is as follows:— (Seems to cover same to a certain extent) "No person shall make or maintain any connection with any public sewer or appurtenances thereof, whereby there may be conveyed into the same any hot suffocating corrosive, inflammable or explosive liquid, gas vapor, substance or material of any kind, and no person shall cause to enter or flow into any public sewer or appurtenance thereof, any hot, corrosive, suffocating, inflammable, or explosive liquid, gas vapor, substance or material of any kind provided that the provisions of this paragraph shall not apply to water from ordinary hot water boilers of residences."

There are also rules for the installation of garage traps and oil separators, but it would be difficult to compel private garages to install expensive traps and separators, but for the large establishments, it would almost seem necessary.

Secondly, the ventilation of sewers and conduits by ventilated man-hole covers and by untrapped house connections seems to be the most effective method of overcoming the dangerous explosions which are liable to occur as there are bound to be some gases passing through, and you are probably all aware that there will be numerous violations of any ordinance without being able to detect them.

Oil entering the sewer is also an expensive factor in maintenance, as it adheres to the walls of the pipe, and is very difficult to remove as it will not break up like ordinary greases from kitchen wastes.

The Calgary system of services by the omission of the house trap are ventilated by all house connection and through manhole covers, and we have not as yet met with any explosions, but are experiencing some

difficulty with the heavier oils. Those cities continuing the use of trap on house connections and who are about to lay gas mains through the streets are liable, in my opinion, to have the experience of other cities under like conditions.

Mr. Swain, St. Boniface: I move that the best thanks of the members be tendered Mr. Fletcher for his splendid paper, and that instructions be given to hand over the papers to the Publication Committee for publication in the trade journals.

Mr. Ochampaugh, Edmonton: I second that motion.

Chairman: Motion carried.

Mr. Swain, St. Boniface: I move that the sum of \$50.00 over and above his expenses be given to the Secretary as a token of our appreciation of his arduous services.

Mr. Nash, Edmonton: I second the motion.

Chairman: Motion carried.

Mr. Fletcher, Calgary: I would like to make a resolution on behalf of the Canadian Institute of Sanitary Engineers that we thank the City of Edmonton, the Master Plumbers of Edmonton, the Plumbing Inspectors of Edmonton and the Industrial Association for the cordial way in which they greeted and entertained us.

Mr. Mathias, Regina: I second the motion.

Chairman: It is moved that the heartiest thanks of the Institute be extended to the City Council, the Master and Journeymen Plumbers, Plumbing Inspectors and the Edmonton Industrial Association for the very hearty manner in which they have entertained us in Edmonton. I feel like Mr. Fletcher they have done too much for us.

Motion carried.

Chairman: I suggest that the Secretary be instructed to write to the various bodies referred to in this resolution.

Mr. Swain, St. Boniface: I make a motion that the proceedings of this meeting be printed in book form and supplied to the representatives of the Municipalities and others that wish them.

Mr. Nash, Edmonton: I second the motion.

Motion carried.

Chairman: It has been a pleasure to me to be present and conduct your meetings. It has been a pleasure to listen to you all, and I thank you for the honor of re-electing me as President for the coming year and I will do all in my power to warrant your approval.

List of Members

Canadian Institute of Sanitary Engineers

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PLUMBING BY-LAW

As Passed at Convention of
Canadian Institute of Sanitary Engineers
In Winnipeg 1913 and Edmonton 1914

1. In this By-law the following terms shall have the meanings respectively assigned to them:—

Definitions.

"Fixture" includes every water closet, sink, wash basin, bath or wash-tub and every other water supplied convenience which is directly connected with the plumbing and drainage system in any premises.

"House-drain" means the drain which connects with the sewer connection outside the external walls of and extends inside and under the premises and which receives the drainage from soil and waste pipes and rain water leaders.

"Sewer Connection" includes the drain used to convey the drainage from the house drain to the main sewer.

description vested in or under the control of the City of or Municipality of

"Main Sewer" includes all sewers and drains of every

"Plumbing and Drainage System" includes any system or arrangement of one or more pipes and drains (including the fittings and appliances attached thereto or forming a part thereof) in, upon or about or connected with any premises, for conducting or carrying away rain, storm surface waste and soil water and other waste from the premises, and for the ventilation of such pipes or drains and for supplying such premises with water for all purposes; and any part or portion of such system.

"Premises" includes every house, tenement block, warehouse, hotel, school, factory, workshop or building in the City of or Municipality of

"Rain-Water Leaders" include the pipes which convey rain and surface water from the roofs and paved surfaces of any premises to the house-drain.

"Soil Pipes and Waste Pipes" includes the pipes which convey the waste water and other discharges from any fixture to the house-drain.

"Stack" includes any line of pipe extending from the house-drain through the roof of the premises.

"Ventilating Pipe" shall include every anti-syphon pipe, vent-pipe and every other pipe intended to ventilate any plumbing and drainage system.

"Work" includes any operation involving the construction, reconstruction, renewal, addition to or extension of any plumbing and drainage system, or any part thereof, for which a permit is required under this By-law.

"Vent Pipe" a vent pipe is any special pipe provided to ventilate a plumbing and drainage system to prevent trap-syphonage, back-pressure and to facilitate the flow of sewage by free admission of air.

"Soil and Waste Vent" the soil or waste vent is that part of the main soil or waste pipe above the highest installed branch or fixture outlet connection and extending through the roof.

"Back Vent" a back vent is that part of a vent pipe line which connects directly with an individual trap near the fixture and extends either to the main or a branch vent.

"Circuit Vent" a circuit vent is a system of venting by which the ventilation is effected by extending the branch soil or waste pipe and connecting them with an auxiliary main vent, which vent in conjunction with the main soil or waste vent completes and forms a continuous air circuit or vent for each branch line so installed.

"Loop Vent" a loop vent is a circuit vent where the branch or branches of soil or waste pipe of only one floor, having no other fixtures or branches installed above them, loops over above the flow line of the fixtures and reconnects with the main soil or waste vent lines.

"Continuous Vent" the term "continuous vent" refers to that method of venting in which the soil or waste pipe being continued vertically in a straight line forms the vent, the trap being vented through the waste fitting.

"Master Plumber" includes any person, firm or corporation carrying on the occupation, trade or business of Plumber on his or its own account or executing any work pertaining to such occupation, trade or business in the City of or Municipality of and also any person, firm or corporation duly licensed under this By-law.

"Owner" includes every person in possession of any premises or in receipt of the whole or of any part of the rents and profits therefrom, whether on his own account or as agent or trustee for any other person, or in the occupation of any such premises either as a tenant from year to year or for any less term, or as a tenant at will, and the agent of any such person.

"Person" shall include every person, firm or corporation.

"Plumbing Inspector" shall include the Sewer and Plumbing Inspector of the City of or Municipality of and any of his assistants.

2. No person shall construct, reconstruct, renew, add to, alter or extend, or cause or permit to be constructed, reconstructed, renewed, added to, altered or extended any plumbing and drainage system or any part thereof in any premises, until he shall have obtained a permit from the

Permits
required.

Plumbing Inspector, as hereinafter provided. No work authorized by any such permit shall be executed by any person other than a Master Plumber duly licensed under this By-law as hereinafter provided.

3. Before constructing, reconstructing, renewing, adding to, altering or extending any plumbing and drainage system or any part thereof in any premises, the Owner of such premises shall apply to the Plumbing Inspector for a permit authorizing the work proposed to be done upon the same. Such application shall be made in writing and in the form, as far as applicable, of Schedule "A" to this By-law. Such application shall include a precise statement of the work proposed to be done and the sizes, description and weights of all pipes, traps, fittings, fixtures and materials to be installed, and shall be accompanied by a plan showing the part of the plumbing and drainage system situated underground and a sectional elevation or elevations showing the arrangement of the soil, waste and vent pipes, traps and fixtures, whether existing or to be installed.

Owner to
apply.

4. All plans referred to in the immediately proceeding section shall be legibly drawn in ink on tracing linen, or may be blue-prints, and shall be drawn to a scale of not less than eight feet to one inch.

Plans.

5. If the application is made in due form and the work proposed to be done conforms in every respect to the provisions of this By-law, the Plumbing Inspector shall issue a permit in writing therefor. Such permit may be in the form of Schedule "B" to this By-law.

Permit to be
issued by
Plumbing
Inspector.

6. Where a permit has been issued for any work under this By-law, no alteration or deviation shall be made from the same, as shown in the application for such permit; provided that the Owner may make a fresh application for a permit authorizing any alteration or deviation in the form prescribed by section 4 of this By-law, and a fresh permit may be issued by the Plumbing Inspector authorizing the same.

Alteration and
deviations.

7. The Plumbing Inspector shall inspect and attend all tests of all work for which a permit has been issued under this By-law in the manner hereinafter set forth.

Plumbing
Inspector's
duties.
Notice.

8. The Plumbing Inspector shall be notified in writing by the Master Plumber executing work for which a permit has been issued under this By-law, when such work is ready for inspection or testing. Such notice may be in the form of Schedule "C" to this By-law.

9. All work shall be left uncovered and convenient for examination until the same has been inspected and tested in terms of this By-law. If any such work or any portion thereof has been covered before being inspected and tested, as before provided, the same shall be uncovered by the Owner or Master Plumber executing such work, and left uncovered until such inspection and testing are completed.

Work to be
uncovered.

10. Every plumbing and drainage system, and every addition to, alteration, extension or reconstruction of any

Tests.

such system to which this By-law applies, shall be subjected to an air or water test in the manner hereinafter provided, before the fixtures have been erected.

Air tests.

11. The air test shall be applied by closing all openings in the plumbing and drainage system or part thereof to be tested and by filling the same with air at a pressure of not less than five pounds per square inch, this pressure to be maintained for a period of not less than five minutes.

Water test.

12. The water test shall be applied by closing the lower end of the house-drain and all other openings in the plumbing and drainage system, and by filling the pipes with water to the highest opening above the roof. Any part of such system may be tested separately, but in such case the head of water shall be at least five feet above all parts of the part so tested. The water test shall not be applied in extremely cold weather unless the premises are heated.

Smoke test.

13. Within seven days after the completion of the work authorized by any permit issued under this By-law, the Master Plumber executing the same shall give notice in writing of the fact to the Plumbing Inspector. Such notice shall be in the form of Schedule "D." Such work shall thereupon be subjected to a smoke test which shall be made by closing all openings in, and filling the entire plumbing and drainage system of which it forms a part with smoke injected therein by such suitable appliances for the purpose as the Plumbing Inspector may from time to time approve of, under a pressure of one (1) inch water column. Provided that in the case of any addition to, or alteration, extension or reconstruction of any such system already installed or for which a permit has been already issued under any existing By-law or By-laws of the City prior to the date of the passing thereof, such smoke test shall be applied to the whole of such plumbing and drainage system.

Testing plugs.

14. In making every air, water or smoke test under the provisions of this By-law, all openings in pipes shall be stopped up by proper testing plugs, screw caps or plugs; the use of wooden plugs, plaster of paris or other similar substance for this purpose is prohibited.

Owner to carry out tests.

15. Air, water and smoke tests to be made under the provisions of this By-law shall be carried out by the owner of the premises in which the plumbing and drainage system, or part thereof, is being tested, and the owner shall furnish all material appliances and labor necessary for the carrying out of such tests. The said tests shall be made in the presence and under the direction of the Plumbing Inspector, and not otherwise.

Right of access for inspection and testing.

16. The Plumbing Inspector and every person authorized by him for that purpose shall have power at all reasonable hours of the day and upon reasonable notice given and request made for that purpose, to enter upon and have free access to all parts of any premises in which there is

being installed, or is, a plumbing and drainage system to which the provisions of this By-law apply.

17. If after such inspection and tests as are prescribed by this By-law, the work so tested is found to have been properly executed and in conformity with the permit or permits issued in respect thereof, and of this By-law, the Plumbing Inspector may, if so required by the Owner or Master Plumber, executing such work, issue a certificate in the form of Schedule "E."

Plumbing
Inspector's
certificate.

18. The entire plumbing and drainage system of any premises shall be separate and independent of that of any other premises, and shall be so extended to property line, excepting in the case of a private garage to be used wholly in connection with a dwelling for the accommodation of an automobile or automobiles by the owner or occupant of said dwelling. The connection of the plumbing and drainage system of a private garage to the plumbing and drainage system of a dwelling shall be made in a manner to be approved by the Plumbing Inspector. Provided that in the case of semi-detached houses, double houses or terrace houses a separate and independent plumbing and drainage system shall be installed in and for each house.

Each system
to be
separate.

19. The house drain shall be not less than four inches in diameter and the fall to the sewer connection shall be not less than a quarter of an inch per foot throughout the length of the said house drain. It shall be laid in a trench cut at uniform grade or it may be constructed along the foundation walls of the premises above the cellar floor or may be suspended from the floor beams by heavy iron or steel hangers as hereinafter provided by section 36 hereof, and not otherwise. It shall be extended at least eight feet outside the external walls of the premises before being connected to the sewer connection, and no premises shall be erected or built over the sewer connection.

House drains.

20. There shall not be placed on any house drain or sewer, any trap or other obstruction which would prevent a free current of air passing through the entire plumbing system.

House traps.

21. A cleanout shall be placed in all cases on the house drain as close as possible to the point where it enters the cellar, the said cleanouts shall be extended to or above the cellar floor. Where there is no cellar in the premises, the cleanouts shall be placed at the most convenient point and extended to the first floor of the premises and constructed in such a way that easy access can be gained to them. The cleanouts for a house drain shall be formed by a Y and extended without change of direction. Cleanouts shall be provided at the foot of each stack and shall be so placed as to be easily accessible.

Cleanouts.

22. The cleanouts on house drains and stacks shall be of the full diameter of the traps, drains or stacks on which they are placed, except where the said traps, drains or stacks are more than four inches in diameter, in which

case the cleanouts shall be not less than four inches in diameter.

23. Cleanouts fitted on cast iron pipes shall be leaded and caulked into faucets or hubs. In no case shall a cleanout be fitted into a plain piece of pipe.

24. (Under consideration) All screwed covers on cleanouts fitted on cast iron pipes shall be made of brass, not less than one-eighth of an inch in thickness, and having a solid square or hexagonal nut not less than one-half inch high and of at least a diameter of one inch, and shall be screwed and properly fitted and made airtight by the use of a suitable gasket. The threaded parts of cleanout fittings shall have not less than five threads of iron pipe size, measuring eight threads to the inch.

Catch basin traps.

25. Every cellar forming a part of any premises to which this By-law applies shall have a catch basin trap to receive the surface drainage including the water from weeping drains, over-flow from tanks or rain water leaders, or other pipes collecting or carrying surface water. Where practicable the catch basin trap shall be placed so that the water line in said trap is six inches above the top of the house drain at the point of connection with the said drain, and shall be at least three feet distant from the house drain.

Pipes to be as direct as possible.

26. The arrangement of drain, soil, waste and vent pipes shall be as direct as possible. All changes in direction of horizontal pipes shall be made with Y branches one-sixteenth, one-eighth or one-sixth bends.

Size of house drains.

27. The size of the house drain shall be determined by the total area of the premises and paved surfaces to be drained thereby, according to the following table, viz:—

Diameter of pipe	Area to be drained
4 inches	3,000 square feet
5 inches	4,500 square feet
6 inches	7,000 square feet
8 inches	15,000 square feet
10 inches	25,000 square feet

Provided that the house drain may be decreased in diameter after passing a rain water leader or surface inlet to such an extent as the Plumbing Inspector may approve, but in no case shall the house drain be less than four inches in diameter.

Inverted joints, etc.

28. No inverted joints shall be used below any fixture. No connection to any iron drain, soil or vent pipe shall be made by boring or tapping the pipe or by a saddle.

Main vertical soil and ventilating stack.

29. In all premises where fixtures are connected directly with the plumbing and drainage system, there shall be a main vertical soil and ventilating stack which shall not be less than four inches in diameter and shall extend from the house drain to a point above the roof of such premises.

30. (Under consideration) All soil and waste pipes shall be of not less than the respective diameters set out in the following table, viz:—

Pipe	Diameter
Main soil pipe	4 inches
Main soil pipe for water closets on eight or more floors	5 inches
Branch soil pipes	4 inches
Main waste pipes	3 inches
Main waste pipes for kitchen sinks on five or more floors	3 inches
Branch waste pipes for sinks, baths and laundry tubs	1½ inches
Or where set in ranges of three or more	2 inches
Branch waste pipes for wash basins	1½ inches
Or where set in ranges of four or more	2 inches
Branch waste pipes for other fixtures	1½ inches

Sizes of soil and waste pipes.

31. Sink waste pipes shall not be connected to closet bends or other branch waste pipes, but shall connect directly with a soil or waste pipe. All horizontal sink or laundry tub waste pipes over five feet in length shall be constructed of iron piping and be provided with a clean-out suitably placed and easily accessible.

Sink waste pipes.

32. All house drains, soil, waste and ventilating pipes and stacks shall be constructed of cast iron, galvanized wrought iron, galvanized steel, or brass pipe, except as provided in the next succeeding section. All underground soil, waste and vent pipes shall be of cast iron.

Material of soil, waste and vent pipes.

33. Branch waste pipes (except sink waste pipes) and ventilating pipes not exceeding ten feet in length may be constructed of lead; such lead pipes shall be of not less than the following weights in proportion to their length, viz:—

Branch lead waste pipes.

Diameter of pipe	Weight per lineal yard
1½ inches	7 pounds
1¾ inches	9 pounds
2 inches	12 pounds
3 inches	18 pounds
4 inches	24 pounds

34. All soil, waste and ventilating pipes shall be located inside the premises, and shall not be placed inside an external wall of a frame building and all terminals of such pipes shall be located not less than 10 feet distant from or 2 feet above any opening window, door or other opening in the building and shall not be located closer than 10 feet to the lot line of premises.

Location of soil pipes and terminals.

35. All terminals of soil, waste and ventilating pipes of 3 inch, 4 inch and 5 inch shall be increased 1 inch in diameter and all under 3 inches shall be increased to 4 inches before passing through the roof, by means of an increaser which shall conform as near as possible to the pitch of the roof, and shall project to the outer air not less than 1 inch and not more than 3 inches above the roof and to be made weatherproof by means of a lead flashing. All such lead used for this purpose shall be in weight at

least 5 lbs. per sq. ft. and shall be worked over and into the hub of increaser at least 1 inch with not less than 5 inches of cover on the roof on either side of the pipe terminal, and it shall be finished with a cast or wrought iron ring properly caulked with lead or oakum and red lead into the hub thereof.

Pipe
supports.

36. All vertical pipes and stacks shall be properly supported at their base, and at intervals not greater than 25 feet. All horizontal cast iron pipes shall be supported at intervals of not more than five feet by proper cast iron, wrought iron or steel pipe hangers or nine-inch brick piers, all horizontal lead pipes shall have continuous support throughout their entire length; and all other horizontal pipes shall have supports at intervals of not more than ten feet.

Traps.

37. Every fixture or drain inlet shall be separately and effectually trapped by a water sealing trap placed as near as possible to the outlet of the fixture, in no case shall a trap be more than two feet distant from such outlet; and all floor drains from lavatories or kitchens shall discharge over a catch basin trap or water supplied fixture.

(a) All fixture and floor drain traps shall have at least one and one-half inch water seal and shall be set true to their water level.

(b) The discharge from a fixture shall not pass through more than one trap before reaching the house drain.

(c) Traps shall not be larger or less than the size of the waste pipe to which they are attached, and shall be properly supported.

(d) Vent horns on earthenware traps are prohibited.

(e) No traps (except earthenware traps) which depend on interior partitions for a water seal shall be used.

(f) All traps on fixtures (except earthenware traps) shall have a suitable means of access for cleaning purposes.

(g) Iron traps for rain water leaders and for cellar drainage shall be not less than four inches in diameter or not less than the size of the rain-water leader, and shall have a seal of not less than four inches.

(h) All cleanouts on lead traps shall be wiped to the trap. The threaded parts of cleanout fittings shall have not less than five threads of a gauge equal to sixteen threads to an inch. All parts of cleanouts shall be not less than one-eighth of an inch in thickness.

(i) The waste pipes from the kitchen sinks of every hotel, eating house, restaurant or other similar establishment shall be connected to a grease trap, which shall be constructed of enamelled cast iron and so placed as to be easily accessible to open and clean, and shall have a water cooling jacket.

Unused
fixtures.
Dead ends.

38. The waste pipes of any fixtures not in regular use shall be kept effectually plugged.

39. Whenever any plumbing and drainage system, or any part thereof, is reconstructed, renewed, extended, remodeled or in any way altered, all dead ends or unused pipes, shall, so far as practicable, be removed and the

openings and connections shall be closed by plugs, screwed, caulked or soldered in.

40. Where soil or waste pipes are placed in any premises for future use, the necessary ventilating pipes shall also be put in at the same time, and the whole work shall be tested and inspected as if the same were intended for immediate use. All openings in such pipes not in use shall be closed by plugs, screwed, caulked or soldered in.

Waste pipes,
etc.

41. No waste pipe from any refrigerator, cold storage or other receptacle in which food stuffs are kept or stored shall be connected with any drain, soil or other waste pipe, but such waste pipe shall discharge into an open water supplied fixture or floor drain properly trapped. Refrigerator waste pipes shall be trapped separately and so arranged as to admit of frequent flushing and shall be as short as possible. Where two or more refrigerator waste pipes are connected together or to a stack, said waste pipe or stack shall be extended through the roof of the premises for ventilation.

42. The waste pipe from water filters, gas engines, soft water lifts or air compressors shall not be connected directly with any drain, soil or other waste pipes. But shall discharge into an open fixture or floor drain properly trapped.

43. Overflow pipes from tanks shall discharge into a properly trapped fixture or floor drain having a waste pipe at least equal in diameter to the overflow pipe. Emptying pipes from tanks shall discharge in the same manner as required for overflow pipes or they may be connected with the overflow pipe.

(a) All wastes from drinking fountains and soda water fountains shall be separately trapped and shall discharge into an open fixture or floor drain, properly trapped, provided that in cases where two or more fixtures are connected to waste line the said waste line shall be extended as a vent through roof of the premises.

(b) All bar fixtures shall be separately trapped and shall discharge into an open fixture or floor drain properly trapped, the waste pipe being extended as a vent through roof of premises.

(c) No garage drain shall discharge direct into a house drain or soil pipe. Such pipe shall connect to a catch basin of proper dimensions to be determined by the Plumbing Inspector. The discharge pipe from catch basin shall connect with house drain and shall be provided with such traps as may be necessary to prevent the ingress of gasoline or solid matters into house drain. A local vent must be taken from catch basin and extended through roof.

44. (Under consideration) All traps shall be protected from syphonage by anti-syphon or vent pipes, except where otherwise specifically provided by this By-law. Such

Vent pipes.

pipes shall be constructed according to the following table:—

Diameter Max. length of pipe of pipe		No. and Sizes of Traps that may be vented thereby
1½ inch	25 ft.	1 trap of 1½ inches in diameter
1½ inch	25 ft.	1 to 3 traps of 1½ to 2 inch in diameter
2 inch	50 ft.	1 to 3 traps of 3 to 4 inch in diameter
2½ inch	75 ft.	4 to 7 traps of 3 to 4 inch in diameter
3 inch	100 ft.	8 to 15 traps of 3 to 4 inch in diameter
4 inch	200 ft.	16 or more traps of 3 to 4 inch in diam.

Four traps of 1½ or 1½ inches in diameter shall be considered equal to one trap of four inches in diameter.

Where yoke vents are used not more than three traps shall be inserted on the yoke without an intersecting vent pipe, and the vent pipe at end of line shall be taken off between the last two fixture fittings.

45. (Under consideration) All offsets on ventilating pipes shall, where practicable, be made at an angle of not less than forty-five degrees to the horizontal, and all ventilating pipes shall be connected at the bottom with a soil or waste pipe or the house drain, in such a manner as to prevent the accumulation of rust scale. Branch ventilating pipes shall be kept above the top of all fixtures connecting therewith or be constructed in such a manner as to prevent the use thereof as soil or waste pipes.

46. (Under consideration) Vent pipes shall not be necessary:—

(a) Where the trap for the upper fixture on a stack is not more than three feet from such stack and the connection of the waste pipe to such stack is not more than three inches below the water level of the trap.

(b) Where only one water closet is connected with a stack and is located not more than three feet from such stack.

(c) Where two water closets are located not more than three feet distant from the stack on the same floor and discharged into a double Y branch and no other water closet discharges into the stack above such double Y branch.

47. (Under consideration) Vent or anti-syphon pipes shall be connected to the waste pipe as close as possible to the outlet of the trap and in no case more than twelve inches from it; and such pipes shall not be connected to the crown of the trap. Such pipes must, where possible, be run on the continuous vent or yoke vent principle.

48. (Under consideration) Vent or anti-syphon pipes shall be extended through the roof or may be connected to a soil or waste pipe at a point above the highest fixture connected therewith.

49. Fountain cuspidors may have an anti-syphon trap located as close to the fixture as practicable. The waste pipe from such fixture shall not be less than one and one-quarter inches in diameter.

Fountain
cuspidors.

Cast iron pipe.

50. All cast iron pipe and fittings must be true to

drawings shown, sound, free from cracks, sandholes, blow-holes and cold shuts. No filling with metal, cement or other material, or burning on of iron to be permitted.

The inside diameter of the barrel shall not be less than one-eighth of an inch less than the normal size of same. The wall thickness shall be uniform showing no greater variation than 1-32 inch in "X.H." pipe and 1-64 inch in "Med" pipe and at hub and spigot ends to present a true circle.

The bore shall be smooth, free from fins, ridges and adhering sand and except for unavoidable irregularities the full nominal bore must be maintained.

The iron used in their construction to be of such a quality as will admit of easy cutting with file or chisel. All pipes and fittings shall be thoroughly coated inside and outside with coal tar, pitch or oil and shall have the manufacturer's name or trademark, and whether "Med" or "X.H." clearly stamped on hub thereof.

51. Wrought iron and steel pipe shall be not less than the minimum weight per lineal foot set forth in the following table:—

Wrought iron
and steel pipe.

Diameter of pipe	Weight per lineal foot
1¼ inches	2.24 pounds
1½ inches	2.63 pounds
2 inches	3.61 pounds
2½ inches	5.74 pounds
3 inches	7.54 pounds
3½ inches	9.00 pounds
4 inches	10.66 pounds
4½ inches	12.49 pounds
5 inches	14.50 pounds
6 inches	18.76 pounds
7 inches	23.27 pounds
8 inches	28.16 pounds
9 inches	32.70 pounds
10 inches	40.00 pounds

52. All wrought iron and steel pipe shall be galvanized inside and outside. Fittings for wrought iron or steel vent pipes may be either cast or malleable iron steam or water fittings. All fittings for waste or soil pipes and rain water leaders shall be of heavy cast iron, recessed and threaded drainage fittings, with smooth interior water way, and threads tapped so as to give a uniform grade to branch pipes of at least one-fourth inch per foot, and shall be true to drawings shown. All fittings for wrought iron or steel waste, soil or vent pipes shall be galvanized or asphalted.

53. All brass pipe used for soil, waste or vent pipes shall be thoroughly annealed, seamless, drawn tubing having not less than the outside diameter, weight, thickness and gauge set forth in the following table.

Brass pipe,
etc.

Outside diam. of pipe	Weight per lineal foot	Thickness in inches	British Imp. wire gauge	Brown & Sharp gauge
1½ inches	0.88 lbs.	1-16 inch	16	14
1¾ inches	1.06 lbs.	1-16 inch	16	14
2 inches	1.54 lbs.	1-16 inch	16	14
2¼ inches	2.82 lbs.	7-64 inch	12	10
3 inches	3.41 lbs.	7-64 inch	12	10
4 inches	5.74 lbs.	½ inch	10	8
5 inches	7.22 lbs.	½ inch	10	8
6 inches	8.71 lbs.	½ inch	10	8

All brass pipe used for outlets from fixtures, overflow pipes, flush pipes or any part of a waste pipe on the local side of any trap shall not be less than 16 British Imp. gauge or 14 Brown & Sharp gauge, and all tees, couplings and fittings on such pipe shall be heavy cast brass with iron pipe or standard brass threads and all such fittings couplings, etc., shall be recessed and of first quality brass having a smooth interior and thickness in walls of not less than twice the wall thickness of tube specified in table of brass pipe sizes.

Cast brass drainage fittings and cast brass traps shall be recessed and of first quality brass having a smooth interior and thickness in their walls of not less than twice the wall thickness given in the table of brass pipe sizes. The recessed parts or sockets shall be at least one and one-half times the thickness of the wall of the fitting.

Brass pipe fittings with screw joint connections shall have not less than the following number of threads per inch and depth of bite.

Size of pipe	No. of threads per inch	Depth of bite
1½ inch to 2 inch	20	½ inch
2½ inch to 3 inch	12	¾ inch
4 inch to 6 inch	12	1 inch

All connections between brass pipes and iron pipes shall be made by a brass threaded bushing with a standard iron pipe thread outside and a standard brass thread inside, and all brass fittings and traps shall have legibly stamped on a conspicuous place the name or trade-mark of the maker thereof.

All brass water supply pipes shall be of iron pipe gauge and all threaded connections on such pipes shall be equal to iron pipe threads for same size of pipes and shall be tapered. In no case shall slip joints be made on water supply pipes, except directly at the faucet or bibb. The diameters and weights per lineal foot of all brass tubing used for this purpose shall be not less than is set forth in the following table.

Diameter	Pounds per lineal foot
¾ inch	.62 pounds
¾ inch	.90 pounds
¾ inch	1.25 pounds
1 inch	1.70 pounds
1¼ inch	2.05 pounds

Diameter	Pounds per lineal foot
1½ inch	3.00 pounds
2 inch	4.00 pounds
2½ inch	5.75 pounds

54. No slip joint or coupling shall be used for a connection on the sewer side of any trap.

55. Brass caulking ferrules shall be of cast or drawn brass, not less than four and one-half inches long and one-eighth of an inch thick in every part free from sand-holes and other defects and shall have the following inside diameters, 2½ inch, 3¼ inch and 4¼ inch.

1½ inch ferrules shall not be permitted. Soldering nipples shall be of heavy cast brass, having hexagon shoulders and be recessed for lead pipe.

56. All joints between lead pipes or between lead and brass pipes or traps shall be wiped solder joints. In no case shall wiped cup or bolted joints be made. All joints between iron and lead pipes shall be made with brass solder nipples or ferrules.

Pipe Joints.

57. All joints on cast iron pipe shall be made with picked oakum and molten lead, thoroughly caulked and made gas and water tight. All joints on wrought iron, steel or brass pipes shall be screwed joints made up with a paste of red lead or other suitable substance as may be approved by the Plumbing Inspector and shall be made gas and water tight and the burr formed in cutting shall be carefully reamed out.

58. Fixtures with earthenware traps connected directly with soil or waste pipes, shall have a solid brass floor plate not less than 3-16 inch thick soldered to the lead bend or pipe and screwed to the floor where joists are of wood, and where brass or iron pipe is used screwed to same, and bolted to the trap flange with brass bolts and nuts. The joint shall be made tight with an asbestos graphite ring, red or white lead of the proper consistency or perfect screw joint. In wooden joist construction the connection between the earthenware and soil pipe shall have a suitable length of lead pipe between wiped joint and the under side of floor.

59. All fixtures other than water closets and urinals shall have strong metallic strainers or bars over the outlet to prevent obstruction of the waste pipe. The area of the opening in strainers shall be equal to or larger than, the area of the waste pipe or trap connected to same.

Strainers on
Fixtures

60. All water closets shall be fitted with either syphon discharge flush or pressure tanks or automatically flushing valves of a design to be approved by the Plumbing Inspector. All copper linings of flush tanks shall be of not less than ten-ounce copper.

Water closets

61. Pan, valve, plunger, washout, latrine, and trough water closets are prohibited.

62. All fixtures shall be set open and free from all enclosing woodwork.

63. Every compartment in which one or more water closets or urinals is or are situated shall be ventilated by

means of a local vent pipe constructed of metal piping. Such local vent pipe shall have at least three square inches area in cross section for each water closet or urinal situated in such compartment. When a number of local vent pipes are connected to a main local vent pipe, the latter pipe shall have at least three square inches in area cross section for every water closet or urinal which it serves. Such local vent pipe or main local vent pipe shall be connected to a chimney flue, by a cast or wrought iron pipe of the same diameter and of at least three feet in length which shall be inserted into the flue and thoroughly cemented.

64. No local vent pipe shall be connected to a main local vent pipe at any point below the level of the local vent pipe from the highest compartment in the premises connected with such main local vent pipe.

65. In any premises where water closet compartments are partitioned off from a room used for other purposes, the partition between such compartments and such room shall extend to the ceiling or be ceiled over, and these partitions shall be to all intent and purposes air tight.

66. All water closet or urinal compartments must open to the outer air by means of a window or sky-light having an area of not less than one-tenth of the total floor space of the room in which such fixtures are installed, provided, however, that in no case shall such windows have an area of less than 432 square inches and at least 50 per cent of the area of such window shall be made to open.

67. Water closets or urinals shall not be located in the sleeping apartment of any building, rooms in which such fixtures are installed shall be separated from all other rooms and hallways by substantial partitions extending to the ceiling.

68. No water closet or urinal shall be placed in any cellar or basement unless such cellar or basement has a cement or other floor impervious to moisture and is well lighted with natural or artificial light and has easy means of access.

Storage tanks.

69. All tanks for storing water intended for drinking or cooking purposes shall be covered so as to exclude dust and shall be so located as to prevent the water contained therein from being contaminated by gas and odors from fixtures, such cover shall be of metal, tight fitting and provided with means of access for cleaning purposes.

Urinals.

70. Urinals installed in any public or semi-public building, hotel, lodging house, etc., shall be of vitrified earthenware of the integral stall type only. Such urinals shall only be placed in rooms having the floors and the walls to a height of four (4) feet finished in tile laid in cement, such floor to be graded to the trough in the urinal. All urinals shall be fitted with automatic flush tanks so arranged as to discharge at intervals of not more than ten minutes.

Wooden fixtures

71. Wooden baths, wash tubs and sinks and metal lined wooden fixtures are prohibited.

72. No rain water leader shall be used as a soil, waste or vent pipe, nor shall any soil, waste or vent pipe be used as a rain water leader. Every rain water leader inside any premises shall be constructed of cast iron or galvanized wrought iron or steel pipe with roof connection made gas tight by means of a heavy lead or copper drawn tubing, wiped or soldered to a brass ferrule or nipple caulked or screwed into a pipe. Every rain water leader shall be trapped before being connected with the house drain. Any form of construction allowing cement, stone or brick to form a seal or trap is hereby prohibited.

Rain water leaders, etc., not to be used as soil pipe.

73. No steam exhaust pipe, boiler blow-off or drip pipe shall discharge directly into a house drain or soil pipe. Such pipes shall connect to a condensing or cooling tank of proper dimensions. The discharge pipe from such tank shall connect with the house drain and shall be provided with such traps as may be necessary to prevent the ingress of sewer or drain air. Provided that this section shall not apply to ordinary boilers connected with a cooking range or low pressure heating system in any premises; but no sediment cock shall directly connect with a house drain or soil pipe.

Steam exhausts, etc.

74. Gate or back water valves shall not be placed on any house drain or soil pipe in such a manner as to interfere with the ventilation of the plumbing and drainage system. All covers on back water valves shall be bolted or screwed; "lugged" covers are prohibited.

75. No ejector, sump tank or other receptacle for receiving drainage shall be constructed in any premises except in such a manner as may be approved by the Plumbing Inspector.

76. No water cock, bibb, tap or hydrant shall be attached to any water service or pipe connected with the Water Works System of the City of or Municipality of unless the same is of first class quality and has legibly stamped thereon in a conspicuous place the name or trade-mark of the maker thereof.

77. All water supply pipes shall be properly laid and graded with a fall to a stop and waste cock placed in the cellar or other convenient point where they can be entirely drained off. No water supply pipe of any kind shall be installed of less than one-half inch in diameter.

78. All lead water pipes shall be of not less than the following relative sizes and weights, viz:—

Size of pipe	Weight of pipe
$\frac{1}{4}$ inch internal diameter	6 pounds per lineal yard
$\frac{3}{8}$ inch internal diameter	8 pounds per lineal yard
$\frac{1}{2}$ inch internal diameter	10 pounds per lineal yard
1 inch internal diameter	13 pounds per lineal yard

79 All materials used in connection with any work for which a permit has been issued under this By-law shall be of good quality and free from defects and all such work shall be executed in a thorough and workmanlike manner. All faulty or defective work shall be altered or

Faulty work.

made good to the satisfaction of the Plumbing Inspector within seven days from the mailing of the notice herein-after mentioned. The Plumbing Inspector shall, when he becomes aware of such faulty or defective work, notify the owner or Master Plumber in writing specifying such faulty or defective work, and requiring the same to be altered or made good and to conform to this By-law. Such notice may be given by delivering or mailing the same by registered mail to such owner or Master Plumber to his or their last known respective addresses. The final certificate referred to in Section 17 of this By-law shall not be issued until such faulty or defective work has been made good and in conformity with the aforesaid notice.

80. The plumbing and drainage system in all premises shall be maintained by the owner at all times in good working condition and in conformity with this By-law. In the event of any defect being discovered in such system the same shall, on the order of the Plumbing Inspector, be at once repaired and made good.

Appeal.

81. Should the Plumbing Inspector refuse to issue any permit required by this By-law, the applicant for such permit shall have the right to appeal from such refusal to

Such appeal shall be taken by the applicant filing a notice in writing specifying the grounds of such appeal within seven days after such refusal. Said notice shall be filed in duplicate, one copy with the and the other copy with the Plumbing Inspector. The said.....after hearing the applicant and the Plumbing Inspector may, if so advised, direct the Plumbing Inspector to issue a permit to the applicant.

82. No member of this Committee shall sit or adjudicate upon any case in which he is personally or indirectly interested.

Penalty.

83. Any person found guilty of a breach of any of the provisions of this By-law shall be subjected to the penalties imposed by

NOTE.—All Sections dealing with sizes of Soil, Waste and Vent Pipes, and Cleanouts are still under consideration.

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